

Support Services for the  
**WATER FUNDING TASK FORCE**

22 August, 2013

 **OLSSON**<sup>®</sup>  
ASSOCIATES

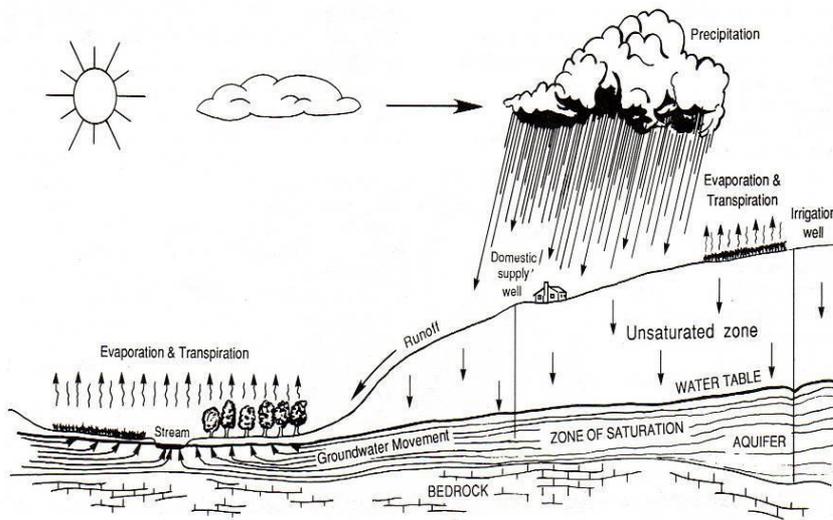
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# LR314 Group 1 – Water Basics

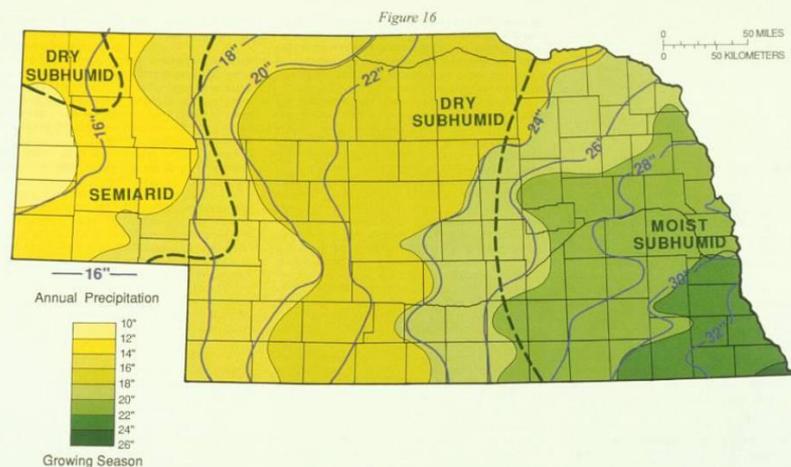
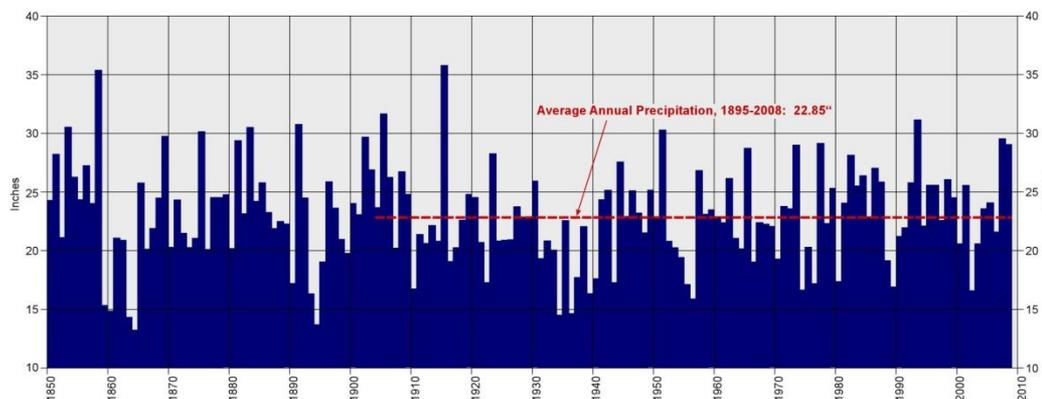
- Basin Delineations, Hydrologic Cycles, etc.



# LR314 Group 1 – Water Basics

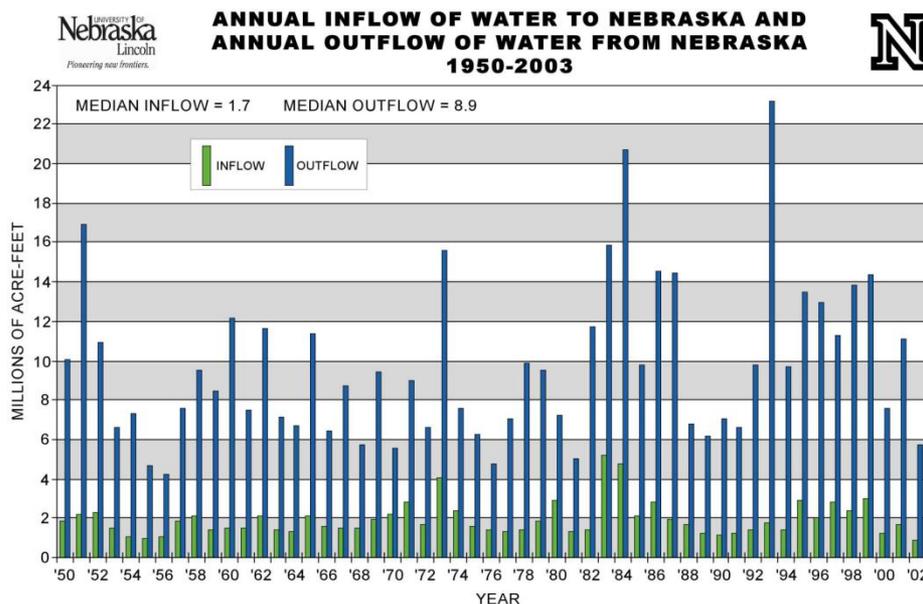
- Basin Delineations, Hydrologic Cycles, etc.
- Statistics – Average Rainfall, Evaporation

Average Annual Precipitation in Nebraska Showing Departures from 1895-2008



# LR314 Group 1 – Water Basics

- Basin Delineations, Hydrologic Cycles, etc.
- Statistics – Average Rainfall, Evaporation
- **Quantifying Nebraska's Water Supply**



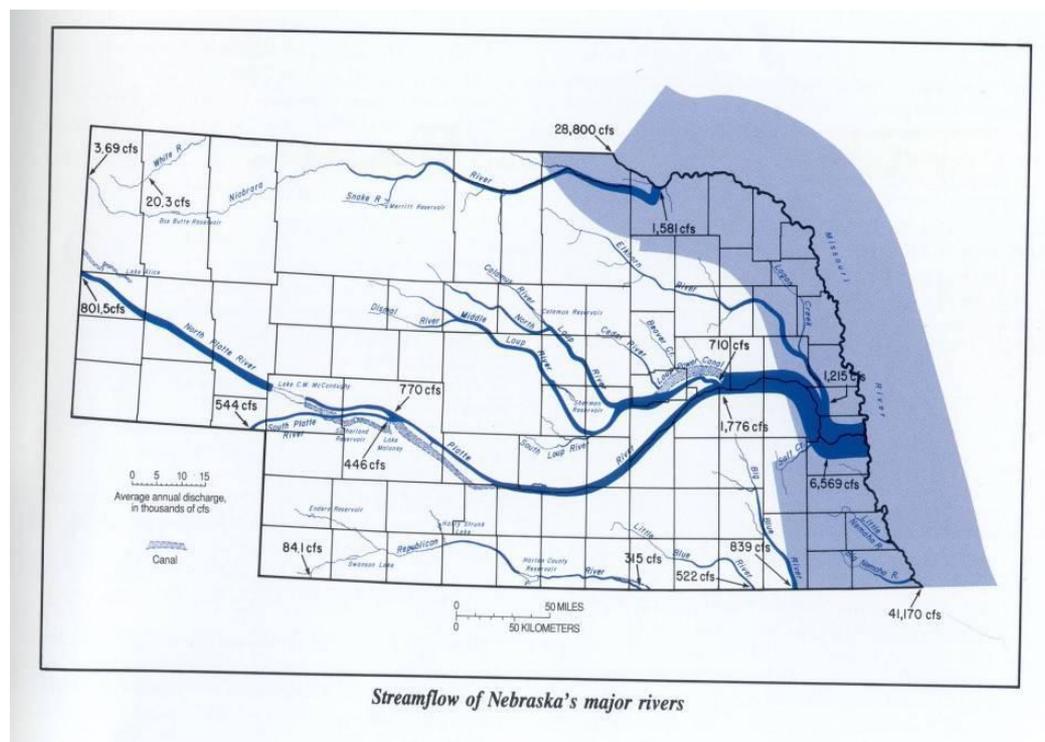
Prepared by:  
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School of Natural Resources  
Institute of Agriculture and Natural Resources  
University of Nebraska-Lincoln

August 2005

Data sources:  
U.S. Geological Survey  
Nebraska Department of Natural Resources

# LR314 Group 1 – Water Basics

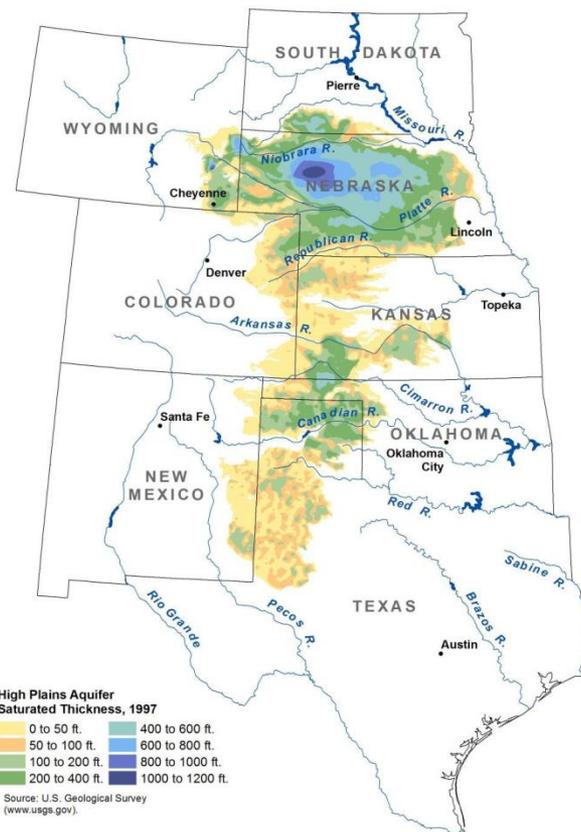
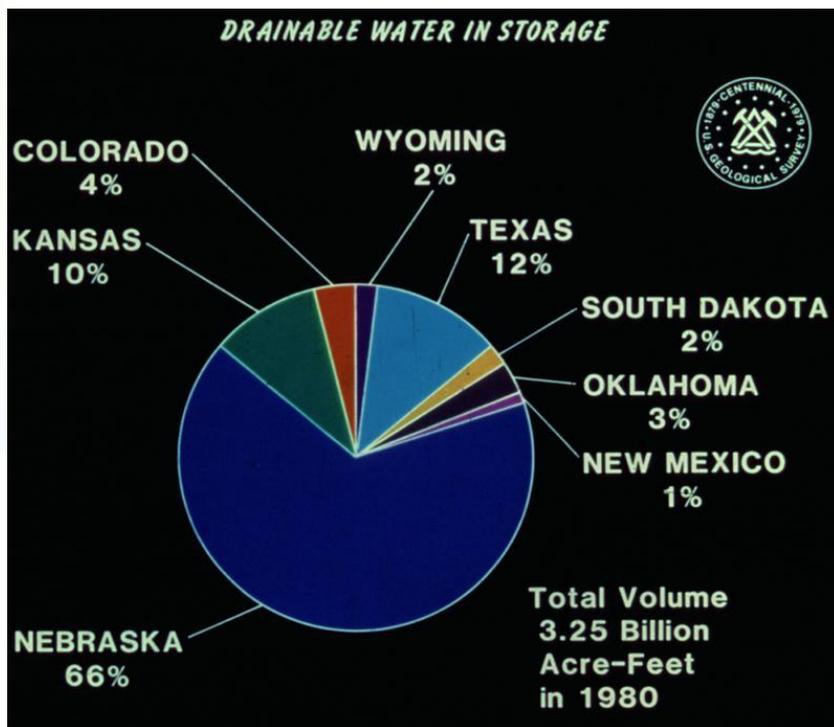
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*Streamflow of Nebraska's major rivers*

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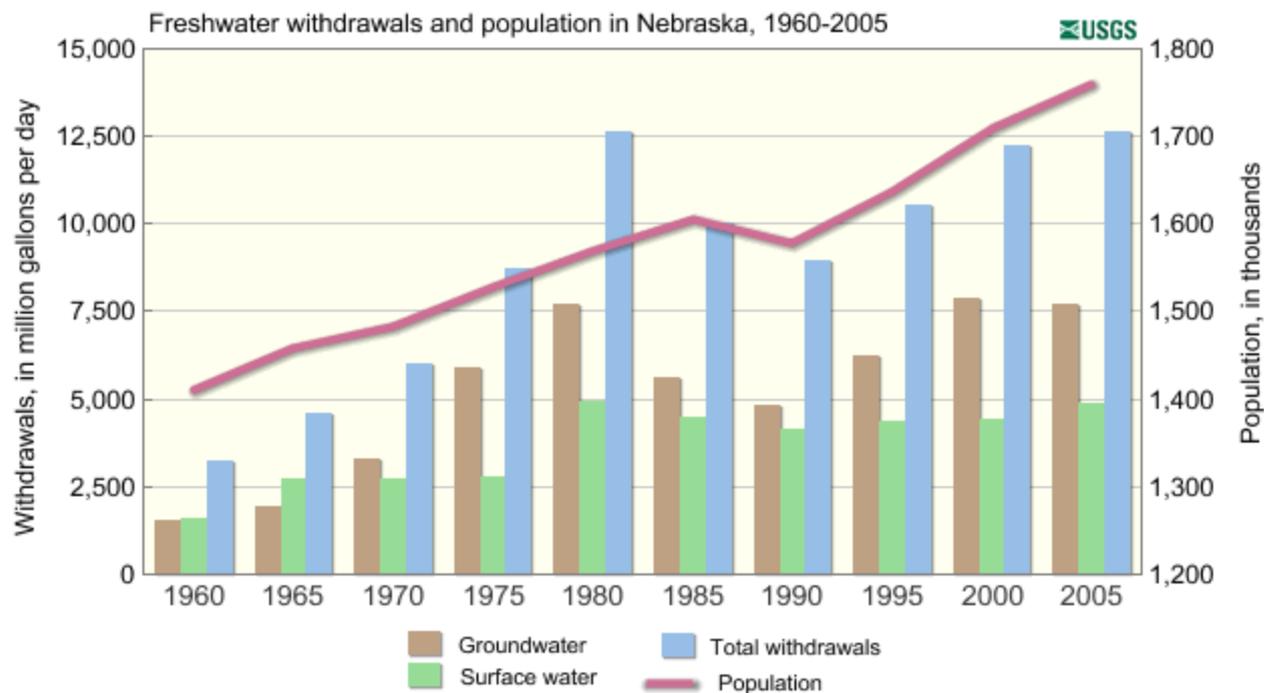
This map was produced by the University of Nebraska-Lincoln. For additional information and an interactive version of this map visit <http://water.unl.edu>

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The information presented on this map is the best available as of July 2008. To order a copy of this map go to [nebraskamaps.unl.edu](http://nebraskamaps.unl.edu). Any questions or comments

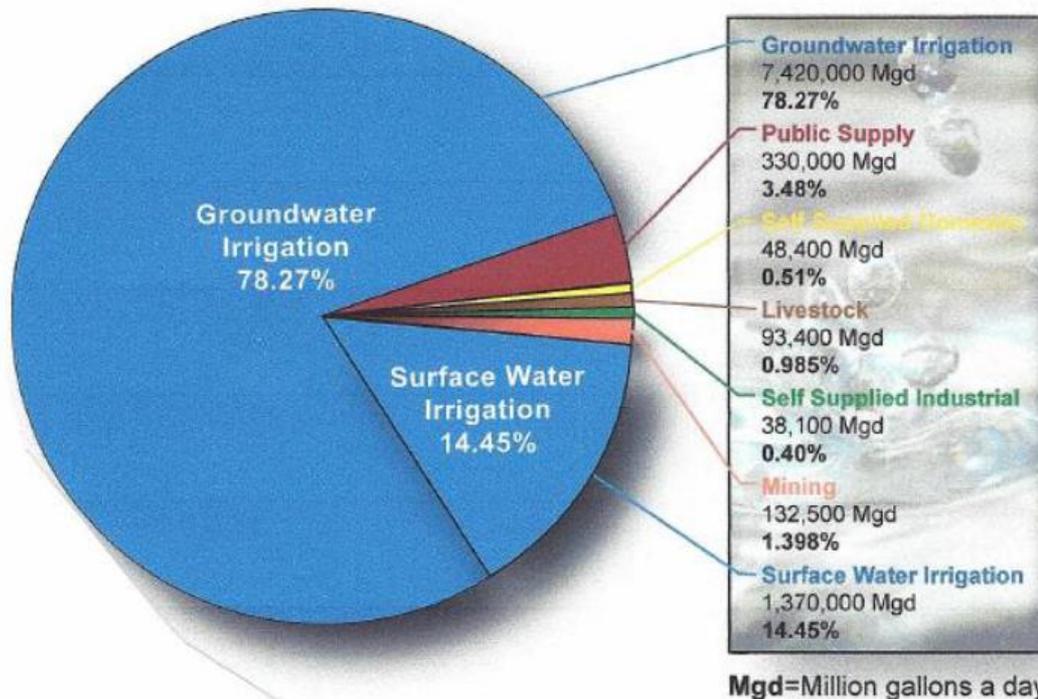
# LR314 Group 1 – Water Basics

- Basin Delineations, Hydrologic Cycles, etc.
- Statistics – Average Rainfall, Evaporation
- Quantifying Nebraska’s Water Supply
- **Quantifying Nebraska’s Water Use**



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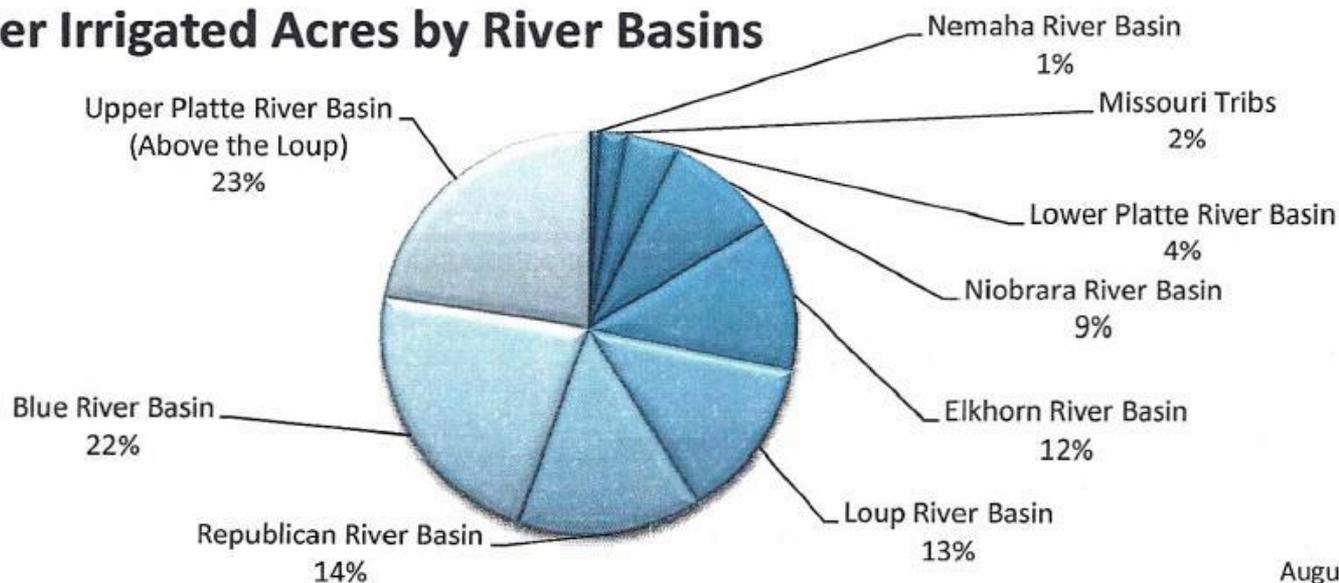
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## Groundwater Irrigated Acres by River Basins



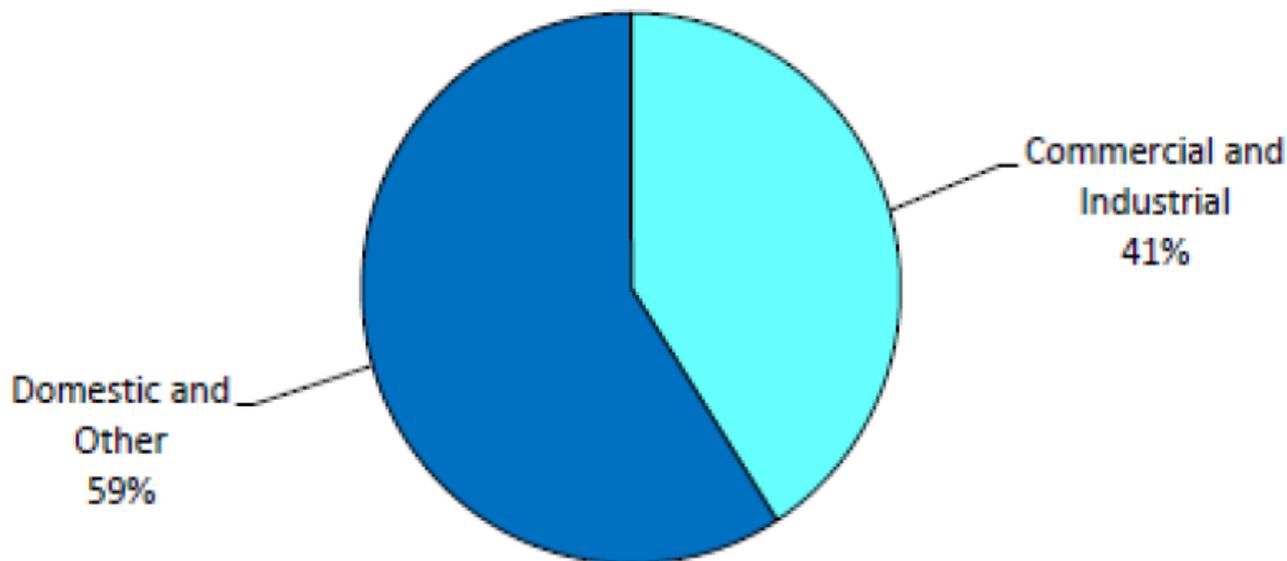
August 2011



# LR314 Group 1 – Water Basics

- Basin Delineations, Hydrologic Cycles, etc.
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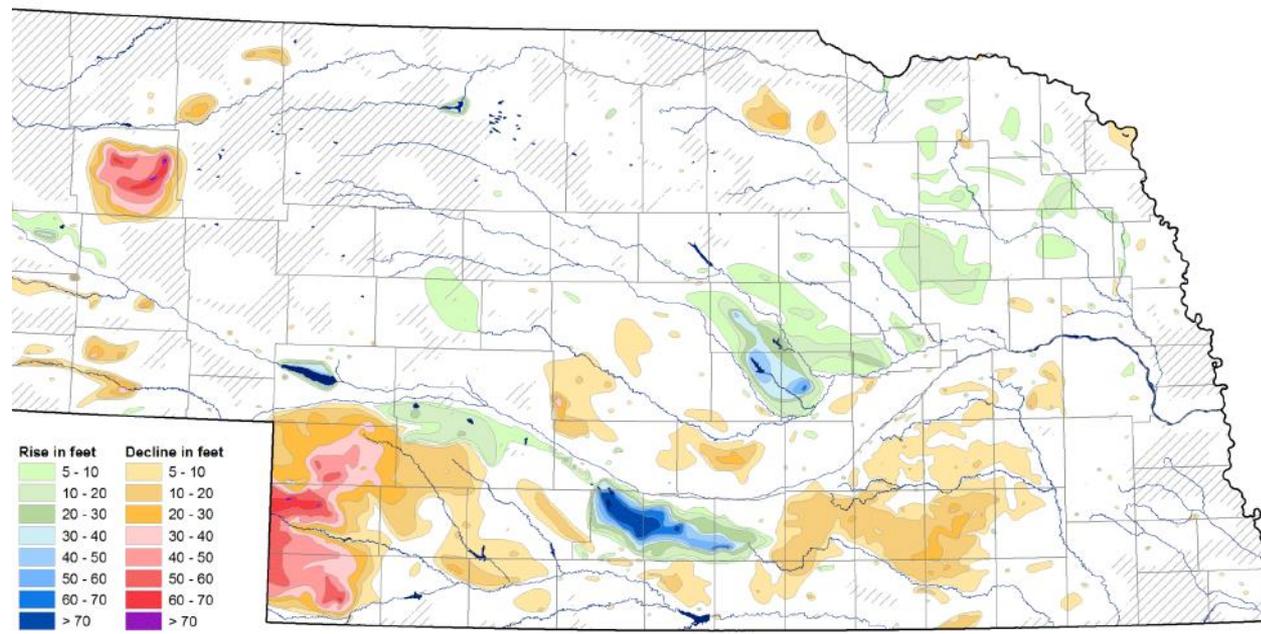
## Municipal Water Use - 10 Year Average



# LR314 Group 1 – Water Basics

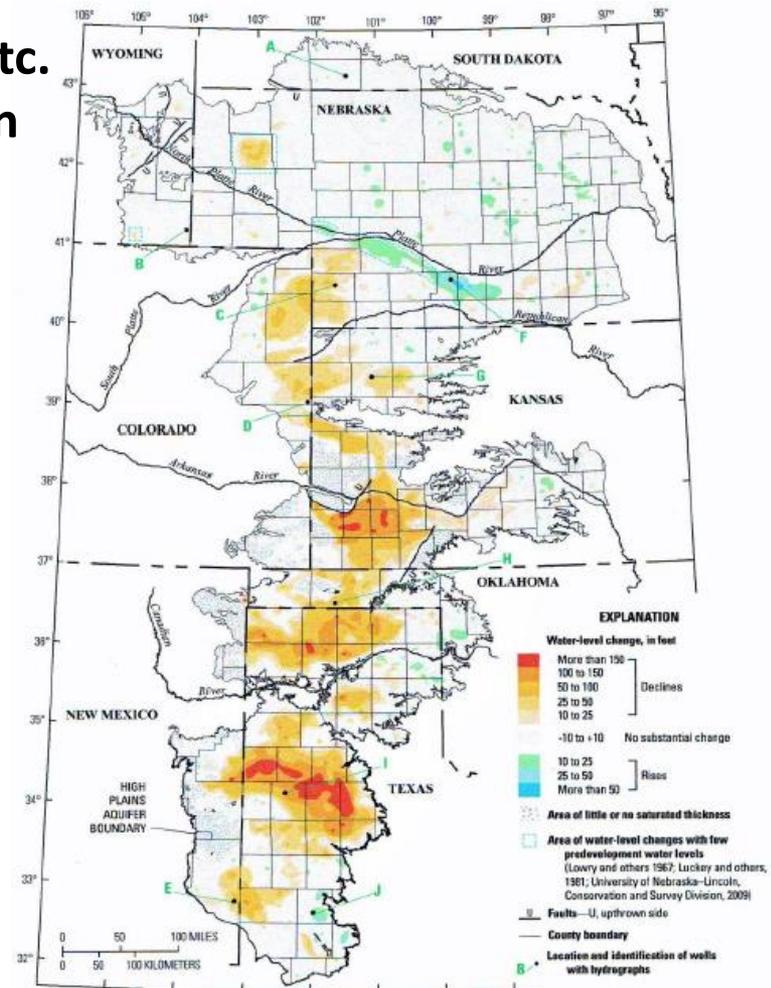
- Basin Delineations, Hydrologic Cycles, etc.
- Statistics – Average Rainfall, Evaporation
- Quantifying Nebraska's Water Supply
- Quantifying Nebraska's Water Use
- **Detailing the Effects of Water Use**

**Groundwater-level Changes in Nebraska - Predevelopment to Spring 2010**



# LR314 Group 1 – Water Basics

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- **Detailing the Effects of Water Use**



# LR314 Group 1 – Legalities

- **Describing the Beneficial Uses of Water**

**In Nebraska, all water appropriations must be for a beneficial or useful purpose. Under statute 46-706, Terms, defined, it states: “Beneficial use means that use by which water may be put to use to the benefit of humans or other species.” When a surface appropriator fails to use the water for the beneficial use specified in the permit for more than five years, the water right can be cancelled by the Department of Natural Resources.**

# LR314 Group 1 – Legalities

- **Describing the Beneficial Uses of Water**

**46-2,108. Appropriation of water for instream flows; terms, defined.**

(1) For purposes of sections 46-1,107 to 46-2,119, unless the context otherwise requires:

(a) Department means the Department of Natural Resources.

(b) Director means the Director of Natural Resources; and

(c) Instream appropriation means the undiverted application of the waters of a natural stream within or bordering upon the state for recreation or fish and wildlife purposes.

(2) An instream appropriation may be obtained only by the Game and Parks Commission or a natural resources district and only for that amount of water necessary for recreation or fish and wildlife. The instream use of water for recreation or fish and wildlife shall be considered a beneficial use of water.

# LR314 Group 1 – Legalities

- **Describing the Beneficial Uses of Water**
- **Description of Water Rights**

**46-204. Natural streams; priority of appropriations; first in time, first in right; preference from nature of use.**

The right to divert unappropriated waters of every natural stream for beneficial use shall never be denied except when such denial is demanded by the public interest. Priority of appropriation shall give the better right as between those using the water for the same purposes, but when the waters of any natural stream are not sufficient for the use of all those desiring the use of the same, those using the water for domestic purposes shall have the preference over those claiming it for any other purpose, and those using the water for agricultural purposes shall have the preference over those using the same for manufacturing purposes.

# LR314 Group 1 – Legalities

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- **Description of Surface Water Rights**

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# LR314 Group 1 – Legalities

- **Describing the Beneficial Uses of Water**
- **Description of Surface Water Rights**

## **46-295. Legislative findings.**

The Legislature recognizes that, as a result of water project operations, surface water in some areas of the state has been, is, and will be in the future intentionally and incidentally stored in and withdrawn from underground strata. The Legislature acknowledges that rights to water intentionally or incidentally stored underground and rights to withdrawal of such water should be formally recognized and quantified and recognizes the propriety of all beneficiaries proportionately sharing, to the extent of potential benefit from intentional underground water storage, in the financial obligations necessary for construction, operation, and maintenance of water projects which cause intentional underground water storage.

The Legislature finds that uses of water for incidental and intentional underground water storage are beneficial uses of water which contribute to the recharge of Nebraska's aquifers and that comprehensive, conjunctive management of surface water and intentional or incidental underground water storage is essential for the continued economic prosperity and well-being of the state, serves the public interest by providing an element of certainty essential for investment in water resources development, and will improve Nebraska's standing in the event of interstate dispute.

# LR314 Group 1 – Legalities

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# LR314 Group 1 – Legalities

- **Describing the Beneficial Uses of Water**
- **Description of Surface Water Rights**
- **Description of Groundwater Rights**

## **46-613. Ground water; declaration of policy; preference in use.**

Preference in the use of ground water shall be given to those using the water for domestic purposes. They shall have preference over those claiming it for any other purpose. Those using the water for agricultural purposes shall have the preference over those using the same for manufacturing or industrial purposes.

# LR314 Group 1 – Legalities

- Describing the Beneficial Uses of Water
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# LR314 Group 1 – Legalities

- **Describing the Beneficial Uses of Water**
- **Description of Surface Water Rights**
- **Description of Groundwater Rights**
- **Federal vs. State Authorities**

## Generally, the state is the top dog in water rights within their state, EXCEPT:

- Federal funding for new water construction projects must adhere to Federal Standards and Principals, which now includes environmental issues.
- National Scenic Rivers and federal lands claim to have an implied surface water right that preserves the resources protected by Congress, also known as a Federal Reserved Water Right.
- The Endangered Species Act can have ramifications for state water use, especially on projects with a federal nexus.

## Generally, the state is the top dog in water rights within their state, EXCEPT:

- On the Missouri River the US Army Corp of Engineers (USACE) regulates water for 8 authorized purposes via the Master Manual.
- USACE also has authority over draining, filling, or disturbances to wetlands and waterways.
- The Environmental Protection Agency (EPA) has authority over water quality through the Clean Water Act, which is administered by the NDEQ.
- The Bureau of Reclamation has some authority over projects that it controls.

## Generally, the state is the top dog in water rights within their state, EXCEPT:

- Conflicts over interstate compacts/decrees may be settled in the U.S. Supreme Court.
- The Federal Energy Regulatory Commission (FERC) may exert authority through the licensing of hydro-power projects.
- The Nuclear Regulatory Commission (NRC) will look at impacts to aquatic wildlife in the relicensing of nuclear power plants.

## Generally, the state is the top dog in water rights within their state, EXCEPT:

- The Federal Water Pollution Control Act, commonly known as the Clean Water Act (CWA).
- Energy Independence and Security Act (EISA) requires federal agencies to execute strict storm water runoff requirements.
- Safe Drinking Water Act (SDWA) regulates public water systems.
- Underground Injection Control (UIC) protects underground sources of drinking water.

## LR314 Group 2 – Existing Funding Resources

- Q1:** How do each of the following groups pay for the water it uses? Surface water users, groundwater users, agriculture, commercial/industry, municipalities, public power, recreation, conservation, rural uses, urban users?
- Q2:** What are current NRD projects and how are they being paid for?
- Q3:** What federal funding for water comes to Nebraska?
- Q4:** What does the state pay for, and where does that money come from?
- Q5:** What are Nebraska's taxes on water?

## LR314 Group 2 – Existing Funding Resources

- Q6: What funding comes from local government?**
- Q7: What funding does the Nebraska Environmental Trust provide?**
- Q8: Are there other non-governmental entities that provide water funding?**

# LR314 Group 2 – Existing Funding Resources

## Historical Review Elements

- The Trelease Report commissioned by Governor Norbert Tiemann dated January, 1969
- The State Water Plan publication entitled “Funding Nebraska’s Future Natural Resources Development” published in December, 1972.
- A special study led by the Nebraska Association of Resources Districts involving NRD officials, state legislators, investment banking leaders, engineers, legal scholars, and state administrative leaders was published in August, 1983. Titled “A Study of Resources Development Financing for Nebraska”.
- Governor’s Water Policy Task Force report and legislation developed by consensus of the Task Force group. Resulted in LB962.

## LR314 Group 2 – Existing Funding Resources

### **Legal Aspects of Funding Resources**

Generally local, state and federal funding is available and widely utilized to support domestic water resources program needs. Water for human consumption and related domestic services is essential and finding the necessary funding to develop the infrastructure to facilitate those needs into reality is always going to occur. It may be fiscally painful; but it happens. The State has generally given the local governments responsible for domestic water needs the statutory authority to fund essential development. The state and the federal government has also generally supported those endeavors with funding assistance as well.

Other more economic, esthetic or environmentally driven needs for water development find the essential financial support more difficult. Reliance upon federal funding is extensive; or nonexistent. Local funding authority is limited and in some instances prohibited. State funding has never been widely advanced.

# LR314 Group 3 – Current Uses & Assoc Costs

## Summary

Nebraska's water resources are used for many reasons generally at minimal cost.

One common problem we ran into in gathering data was overlapping, double counting uses. Water's transitory nature makes it hard to compartmentalize each drop into a specific use, justifying an integral approach to the costs of the different uses of water.

Water needs across the state differ based on precipitation patterns, from east to west across Nebraska the average annual rainfall varies from 36" to under 16". Uses also vary between groundwater users and surface water users.

## LR314 Group 3 – Current Uses & Assoc Costs

### Current Uses

Irrigation:	8 Billion Gallons/Day
Power Generation:	4 Billion Gallons/Day (overlap w/ irrigation)
Municipal Use:	8 Billion Gallons/Year (111 Communities)
Environmental Use:	130k-150k cfs in Targeted Areas
Recreation Use:	Non-Consumptive (?)
Legal Requirement Uses:	( <b>Not listed</b> )

## LR314 Group 3 – Current Uses & Assoc Costs

### Costs

Integrated Mgmt:	\$41.5MM (18 NRDs) *
	\$5.3MM (NDNR in 2010 alone)
	* Doesn't include Water Use Reduction Programs

### Projects

Potable Water:	\$427MM
Wastewater Treatment:	\$717MM
Rivers (Clean Water Act):	\$101,000/mile
Lake Clean up:	\$5MM per 200-Ac lake
CSO-Omaha:	\$3B including bond service
CSO-Plattsmouth:	\$6MM including bond service
NRD Funded:	\$200MM for next five years
NET Funded:	\$4MM short in 2010

# LR314 Group 3 – Current Uses & Assoc Costs

## Costs (Continued)

### Litigation

Republican River:	\$2MM/year
Nebraska vs. Wyoming:	\$24.7MM
Nebraska vs. Kansas:	\$48MM

### Unknown Costs ???

Additional Crop Production

Potential Costs of Compact Non-Compliance

ESA Compliance

# LR314 Group 4 – Predicting Future Needs

## Learning from the Past

What were the past needs and costs? How do they relate to future needs and costs?

- Municipalities – long term
  - \$427 million – clean water
  - \$717 million – waste water
- Irrigation Districts
  - \$10-25 million - short term
  - \$75-200 million – long term
- Natural Resources Districts
  - Short term
    - Existing Projects - \$51 million
    - New Projects - \$92.5 million
  - Long term/Special Projects - \$8.4 million

# LR314 Group 4 – Predicting Future Needs

## Learning from the Past

What were the past needs and costs? How do they relate to future needs and costs?

- Game and Parks
  - \$3 million – short term
  - \$12 million – long term
- Nebraska Wildlife Federation
  - \$5 million – 200 acre lake
- State Projects
  - \$24.5 million

# LR314 Group 5 – Available Information

## Studies, Reports, Research, etc. Conducted By:

- Nebraska Department of Natural Resources
- Natural Resources Districts
- United States Geological Survey
- National Science Foundation
- UNL System
- National Institutes of Health

What type of work is performed? For what purpose?

How do we know it's the best available science?

How is it shared?

## **LR314 Group 6 – DNR and the NRDs**

**What is Each NRDs Budget, Funding Mechanisms, Levy Authority, Levy Use and Project Costs?**

**Are the Same Tools/Practices Used in Rural and Urban NRDs? What is the Difference in Costs?**

**When do the DNR and NRDs Conduct Research/Data Gathering/Do Analysis on the Same Topics for the Same Purposes?**

**What are the Differences in the Methods/Science Used and Costs?**

## **LR314 Group 6 – DNR and the NRDs**

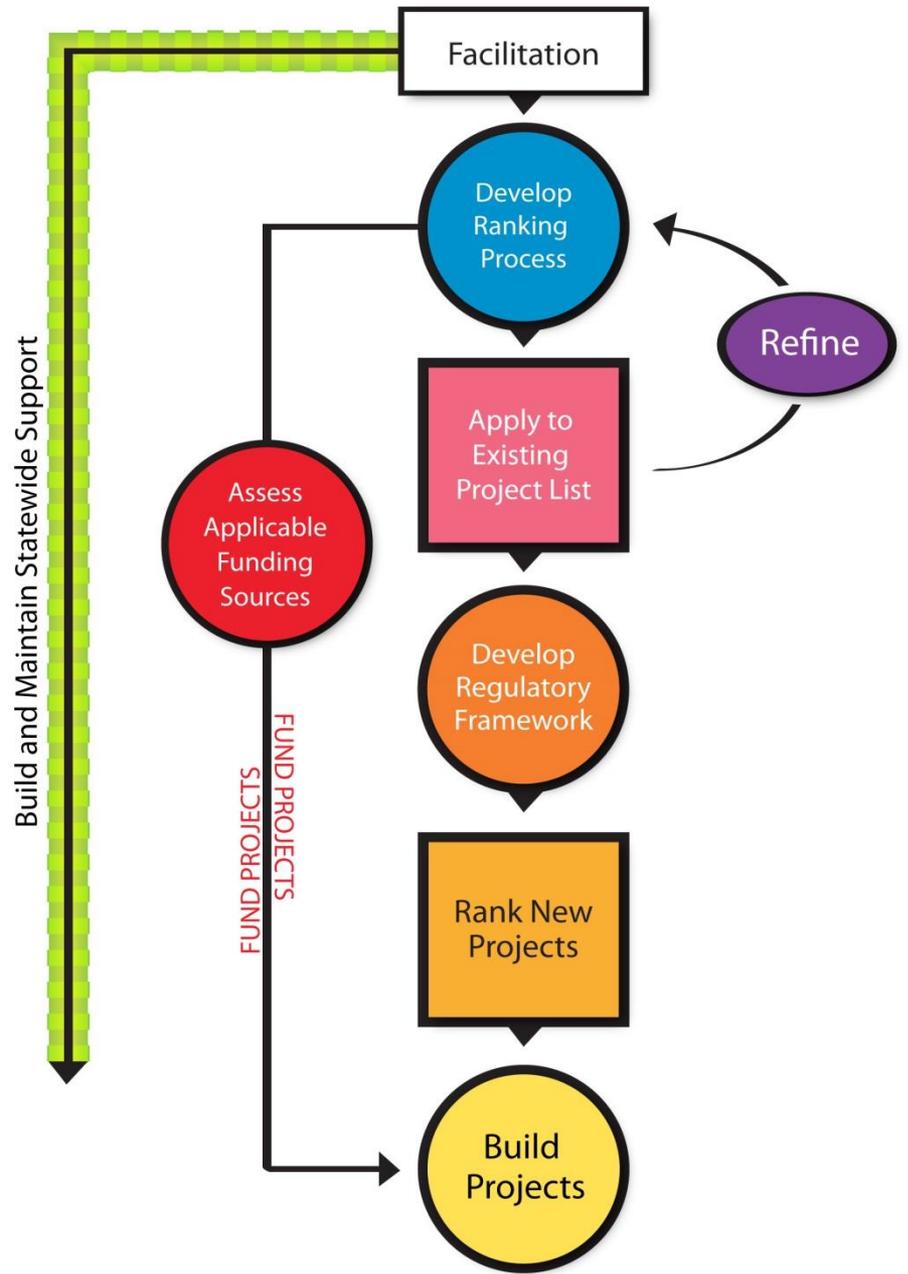
**In what Areas to the DNR and NRDs Partner Their Resources?**

**In what Areas to the DNR and NRDs Not Partner Their Resources?**

**What is the Role of the Irrigation Districts in this Dynamic?**

**What are the Costs Associated with Changes in Basin Appropriation Status?**

# Project Flow Chart



# Support Services for the WATER FUNDING TASK FORCE

## Nebraska Water Funding Task Force - Category and Criteria Evaluation Sheet August 22 and 23, 2013 - Gothenburg, NE

Ranking Criteria	Projects, Programs and Activities				LB517
	Research	Infrastructure	Integrated Management	Compliance	
<i>The extent to which the PPA contributes to multiple water supply management goals, including, but not limited to flood control; municipal uses, agricultural uses; recreational benefits; wildlife habitat; conservation of water resources, and preservation of water resources for future generations.</i>	Research tends to be fairly well focused. Most of the proposed research relates to agricultural activities such as higher yield crops or lower water use.	This seems to be the best fit for infrastructure projects and specifically multi-use projects.	IM projects fit this criteria very well.	Projects are very likely to have multiple benefits that meet these other goals.	vii
<i>The extent to which the PPA provides increased water productivity and otherwise maximizes the beneficial use of Nebraska's water resources</i>	If that is the purpose of the particular research, it would fit well.	Infrastructure development/improvements could lead to large uses or incremental improvements	IM projects fit this criteria very well.	Compliance development/improvements could lead to large uses or incremental improvements	i
<i>The cost effectiveness of the PPA in meeting the state's water management goals</i>	The cost effectiveness would be a function of the long-term results of the research and not likely available for a long time.	Traditional cost-effectiveness analyses are usually easily performed up front for the design life of the project.	The cost effectiveness of IM projects can be increasingly difficult as their benefit to larger aquifer systems is proposed. The more complex the aquifer system, the harder the effect is to model/analyze.	Traditional cost-effectiveness analyses are usually easily performed up front for the design life of the project. However, the value of the tradeoff is subject to scrutiny.	v
<i>The extent to which the PPA assists the state in meeting its obligations under interstate compacts or decrees or other formal contracts or agreements</i>	While the benefits of the research may be years off, again the purpose could fit this well.	This is easily computed for some obligations such as stream flows, etc. and moderately easily computed for environmental, etc. obligations	IM projects fit this criteria very well.	Redundant	ii
<i>The extent to which the PPA promotes objectives described in the Annual Report and Plan of Work for the Nebraska State Water Planning and Review Process issued by DNR</i>	Research seems to tie in generally well with the data gathering goals for the State.	This is easily computed for some obligations such as stream flows, etc. and moderately easily computed for environmental, etc. obligations	This can be easily determined since IM projects are listed specifically by river basin.	While not directly listed as a goal, they are related.	iii
<i>The extent to which the PPA contributes to the state's water management goals</i>	The suitability with the State's goals would be a function of the long-term results of the research and not likely available for a long time.	The suitability with the State's goals would be fairly readily computed.	IM projects fit this criteria very well.	There should be a correlation here.	vi
<i>The extent to which the PPA has been approved for funding through an established state program</i>	Does not seem to fit w/ traditional state programs.	Infrastructure projects often utilize some of the traditional state programs and therefore, this would be easily analyzed.	IM project have not traditionally fit under state programs. The approach is new and therefore, established programs do not exist.	Not traditionally linked in the past, but may in the future.	iv