



INSIGHT: An Interactive Web Portal for Water Information

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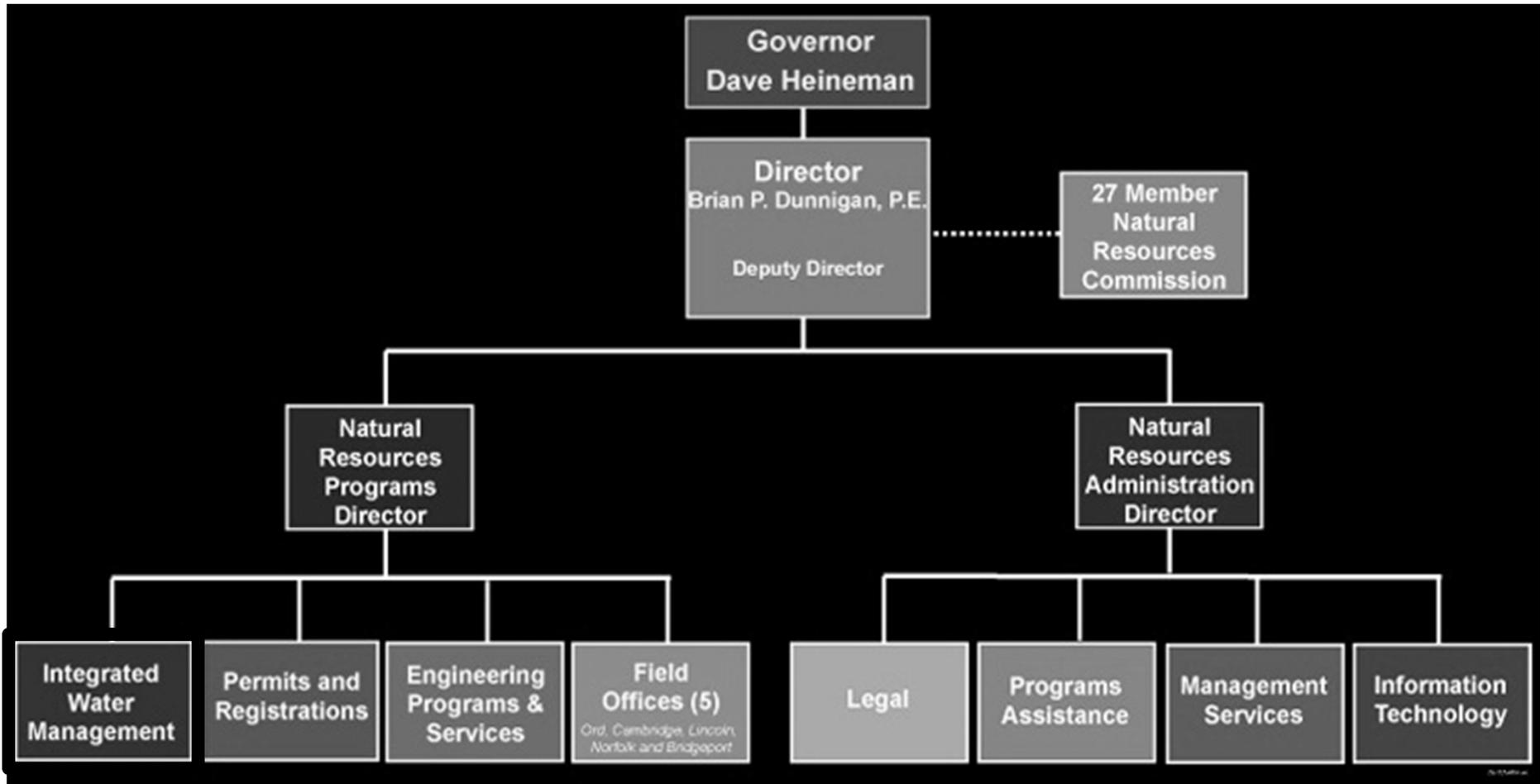
Integrated Water Management Coordinator
Nebraska Department of Natural Resources



Department of Natural Resources



Nebraska Department of Natural Resources

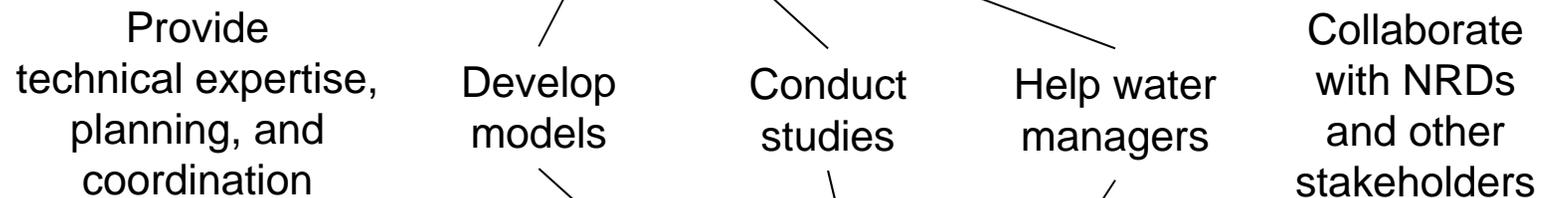




Department of Natural Resources

Integrated Water Management Division

What we do:



To help better understand:

- Nebraska's water supplies and uses
- The effects of potential water management strategies

Overview

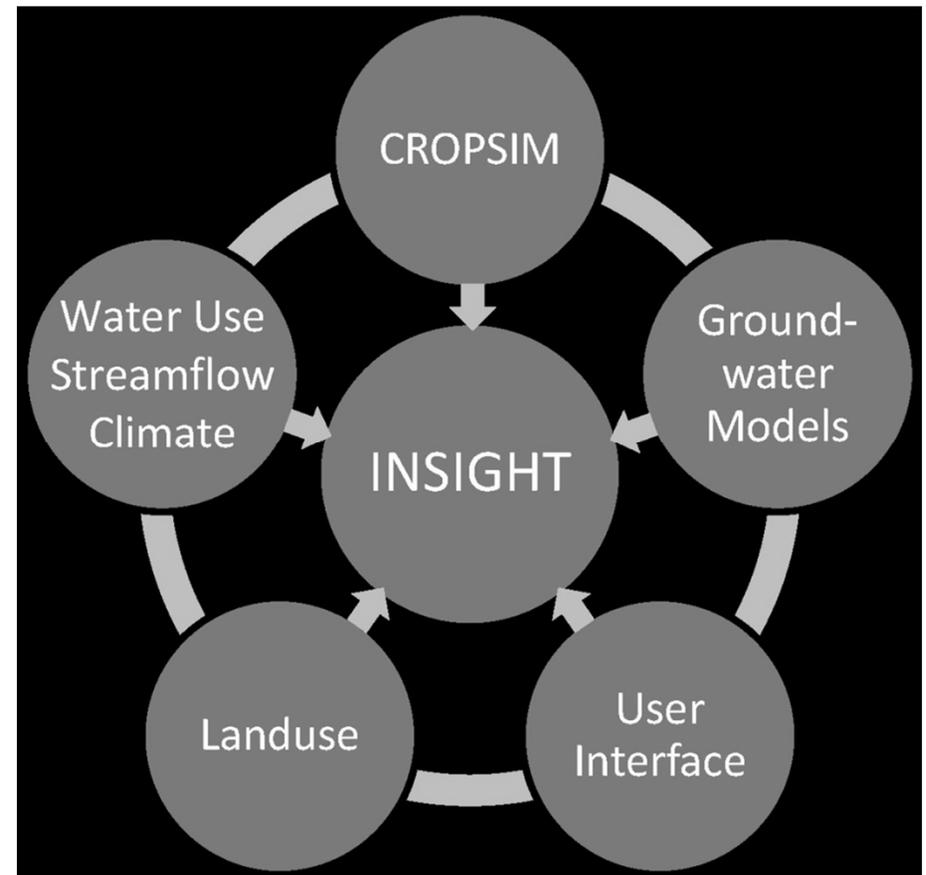
- **INSIGHT**
 - History: Need for easily accessible information
 - What it Entails
 - Implementation and Use in Planning and Monitoring

INSIGHT:

NEED & DEVELOPMENT

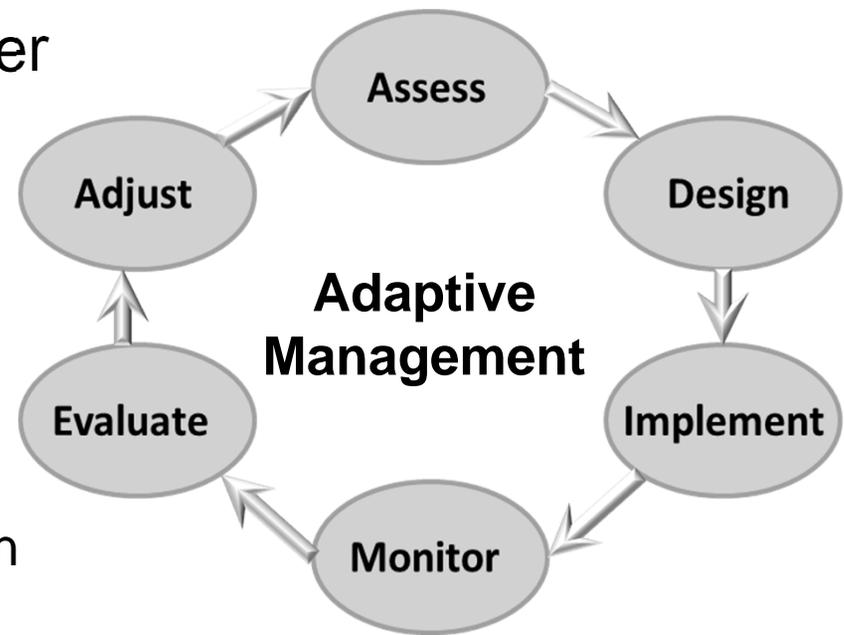
INSIGHT – *Integrated Network of Scientific Information & GeoHydrologic Tools*

- An annual snapshot of water conditions across the state
- An educational tool for water managers and the public
- A tool to help evaluate water management options



INSIGHT was Developed Through Collaboration with NRDs

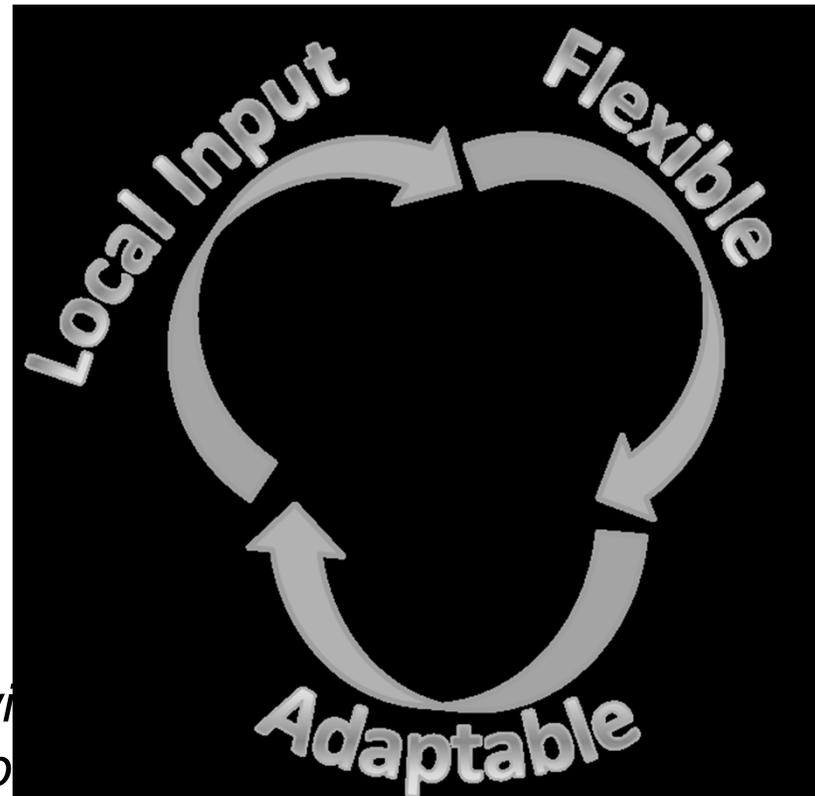
- Part of the Department's goal of adaptively managing hydrologically connected water resources
 - ✓ Pro-active vs. Reactive
- Department & NRDs
 - ✓ Collaborated on:
 - Investigation of process to determine difference between Fully and Overappropriated
 - Selection of INSIGHT consultants through RFPs
 - Data sharing



INSIGHT was developed through Collaboration with the Public

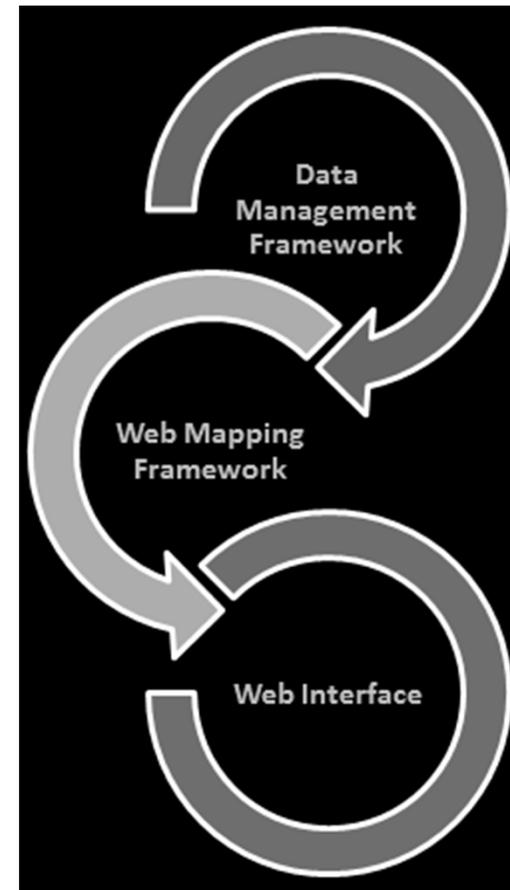
- The Department and stakeholders collaborated through:
 - ✓ Public Q&A sessions
 - ✓ Public hearings
 - ✓ Public comment period
 - ✓ Stakeholder interviews

Stakeholders were provided with various means of providing input (e.g., written/public comments)



INSIGHT was developed through Consolidation of Hydrologic Data

- Water Supplies
 - ✓ Basin water supplies
 - ✓ Groundwater depletions
 - ✓ Surface water depletions
 - ✓ Streamflow
- Water Uses/Demands
 - ✓ Meter data
 - ✓ Diversion records
 - ✓ Climate data
 - ✓ CROPSIM outputs
 - ✓ Water administration data
 - ✓ Land use data
 - ✓ And more...



INSIGHT:

WHAT IT ENTAILS

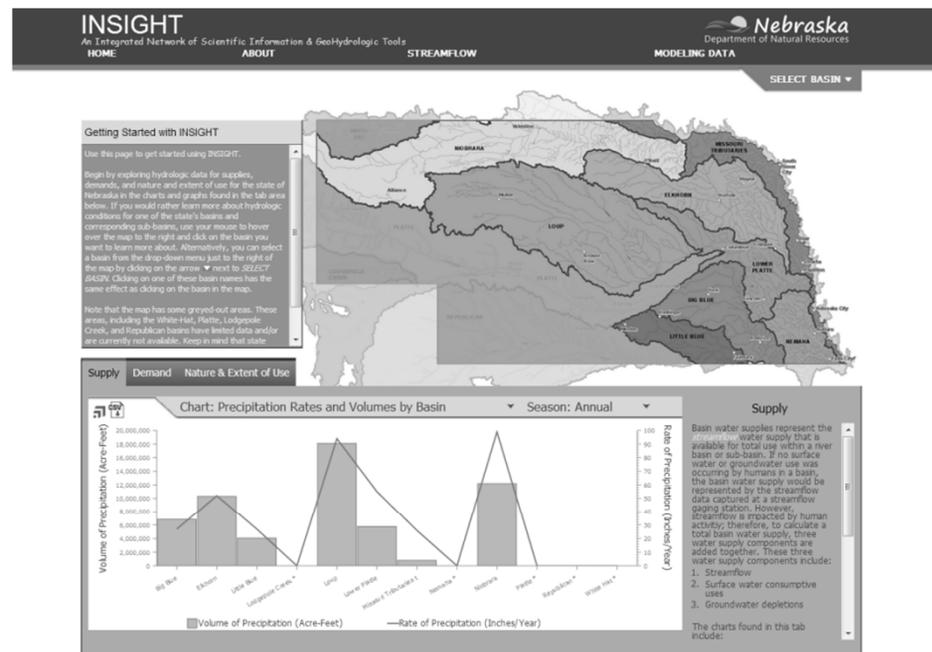
INSIGHT Provides Statewide Basin-to-Basin Comparisons

Information available:

- ✓ Supply
- ✓ Demand
- ✓ Nature & Extent of Use

Seasons available:

- ✓ Annual
- ✓ Peak
- ✓ Non-Peak



Basin & Subbasin Data

A More Detailed Picture

Information available

- ✓ Basin Overview
- ✓ Big Picture
- ✓ Supply
- ✓ Demand
- ✓ Nature & Extent of Use
- ✓ Balance

Seasons available

- ✓ Annual
- ✓ Non-Peak
- ✓ Peak

INSIGHT
An Integrated Network of Scientific Information & Geo-Hydrologic Tools

Nebraska
Department of Natural Resources

MODELING DATA

SELECT BASIN ▾

Explore the Loup Basin

Use this page to explore hydrologic data for the Loup Basin in the tab area below. If you'd rather learn more about one of the 3 sub-basins, use your mouse to hover over the map to the right and click on the sub-basin you want to learn more about. Hydrologic data at the basin and sub-basin levels are presented below in each tab by big picture, supplies, demands, nature and extent of use, and balance.

Navigate to another basin by selecting one from the drop-down list or use the back button in your browser to reach the statewide map to click on another basin in the map.

Basin Overview | Big Picture | Supply | Demand | Nature & Extent of Use | Balance

At a Glance

Basin: Loup

Approximate Area: 14,200 square miles

Basin Water Supply: 1,863,983 acre-feet/year

Near Term Water Demand: 1,899,735 acre-feet/year

Long Term Water Demand: 1,980,915 acre-feet/year

Projected Water Demand: 1,253,872 acre-feet/year

Number of Irrigated Acres: 223,096 acres

Average Consumption by Sector (Acre-Feet)				
	Surface Water		Groundwater	
Irrigation	11,802	100%	107,792	99%
Municipal	0	0%	827	1%
Industry	0	0%	26	0%

The Loup Basin is located in central Nebraska, and is entirely contained within the state. The Loup Basin has an area of approximately 14,200 square miles.

At its farthest western extent, the Loup Basin boundary is about halfway between Alliance, Nebraska, and Hyannis, Nebraska, in Sheridan and Garden Counties. The Loup River headwaters are about seven miles northwest of Hyannis, Nebraska. The basin is defined as draining to the confluence of the Loup River and Beaver Creek, about 25 miles upstream from Columbus, Nebraska. The Loup River extends beyond the basin boundary to its junction with the Platte River at Columbus, Nebraska.

According to the 2010 U.S. Census, the largest city in the basin is Broken Bow, with a population of about 3,600. In descending order, the next largest cities include St. Paul (2,300), Ord (2,100), Ravenna (1,400), and Fullerton (1,360).

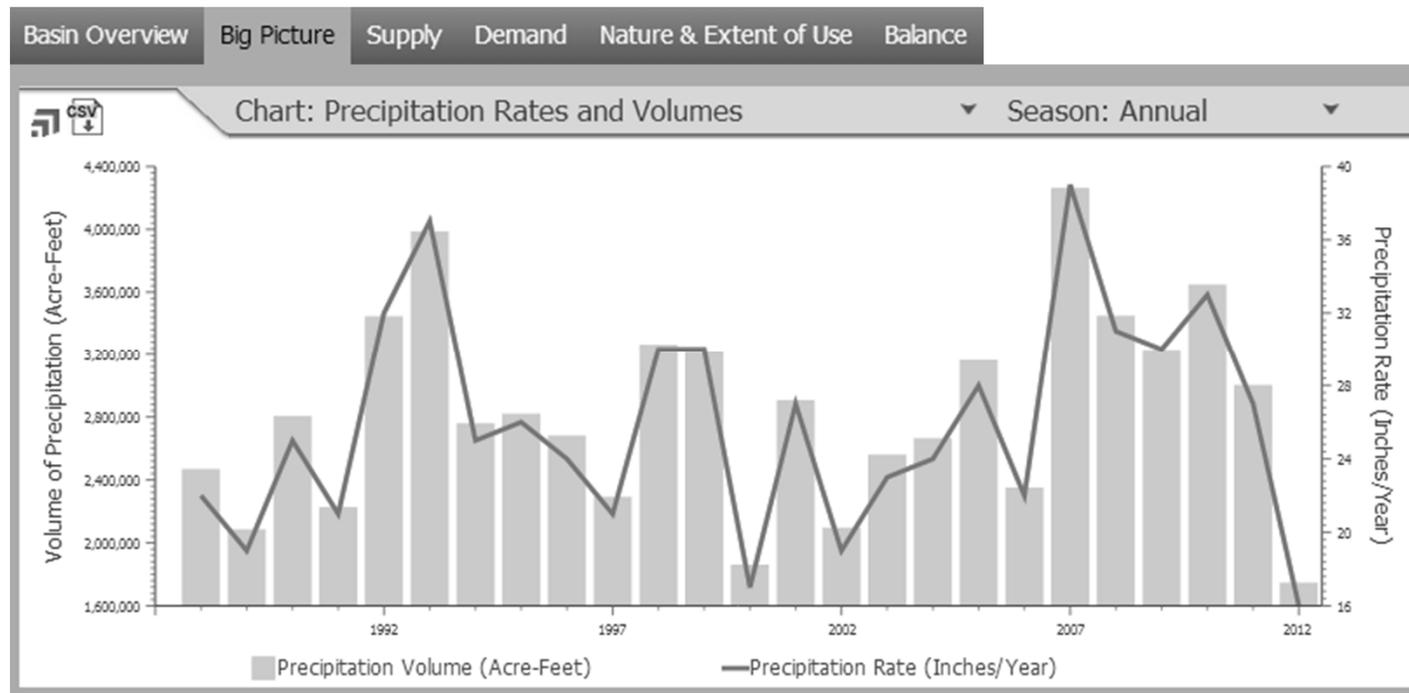
The topography of more than half of the upstream end of the Loup Basin consists of sand hills, which are sand dunes stabilized in place by a grass cover. The downstream portion of the basin consists mostly of dissected plains, with small areas of upland plains. The upland plains are land that is flat to gently rolling and dissected plains are where streams have cut into former plains creating hilly land with steep slopes and sharp ridge crests, along with remnants of the plains on the hilltops. There are several valleys in the Loup Basin, which are the flat-lying areas along the Loup River and its major tributaries.

The primary aquifer in the Loup Basin is the Ogallala Formation, which consists of poorly sorted, generally unconsolidated clay, silt, sand, and gravel. The Ogallala Formation is part of a vast system

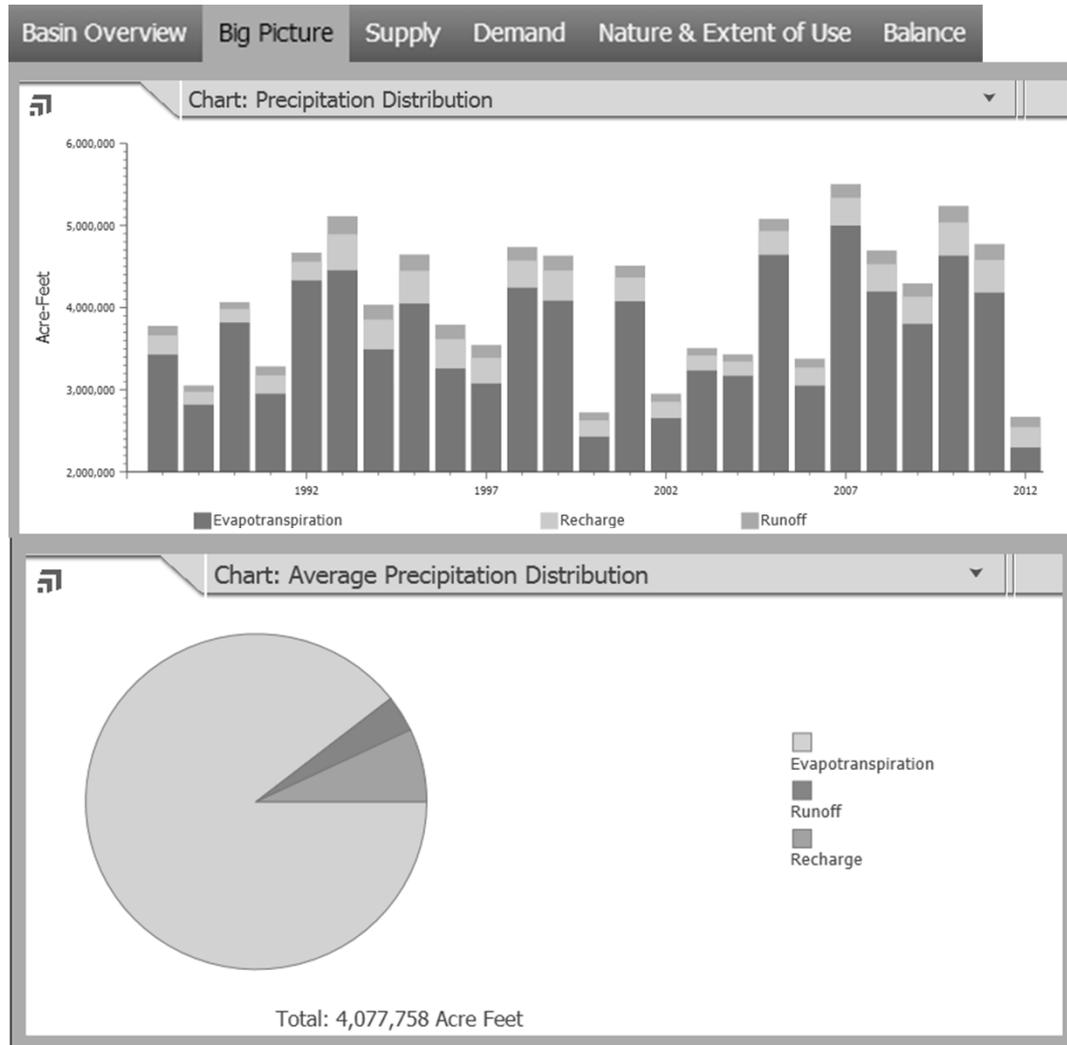


Basin/Subbasin Data: Big Picture

Precipitation Rates and Volumes by Basin



Basin/Subbasin Data: Big Picture

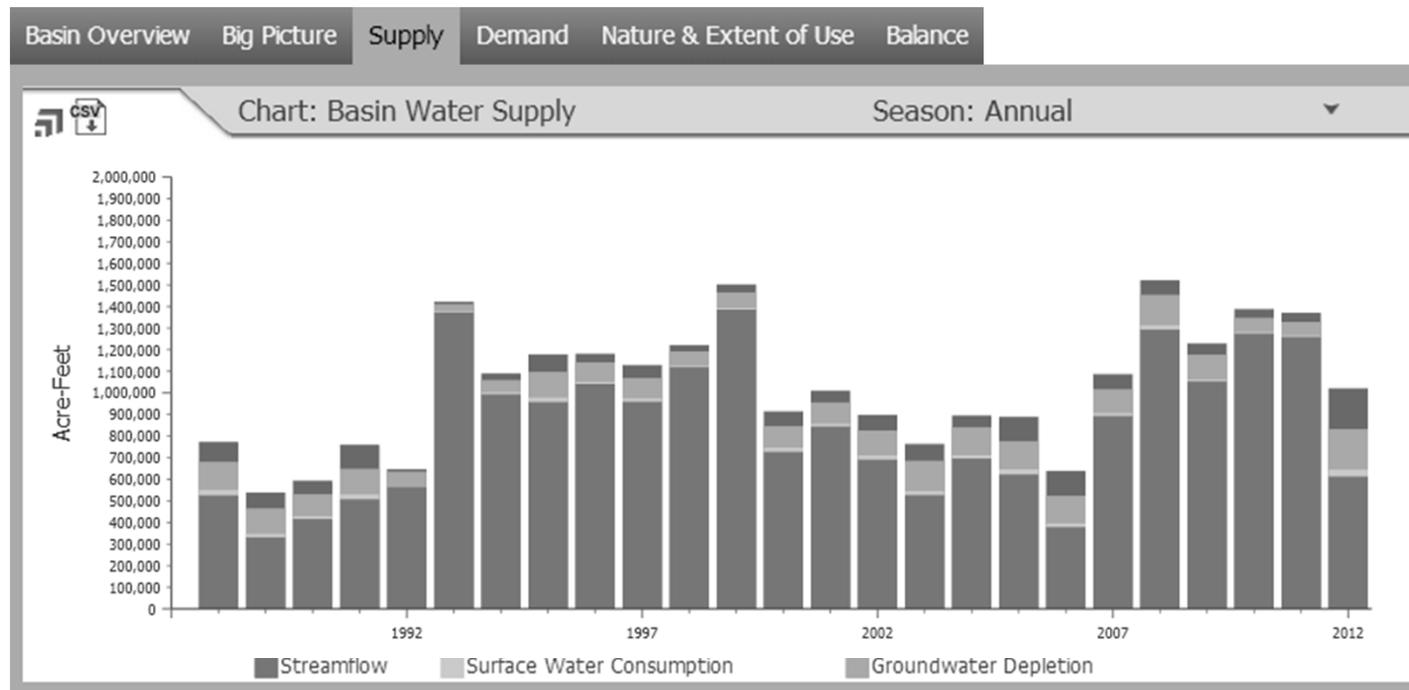


Precipitation Distribution

Average Precipitation Distribution

Basin/Subbasin Data: Supply

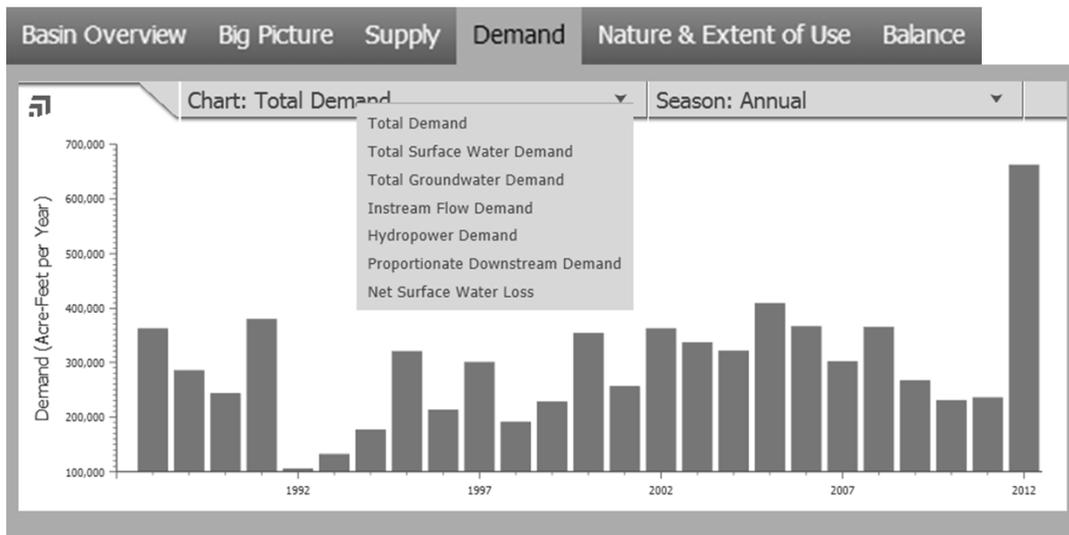
Basin Water Supply



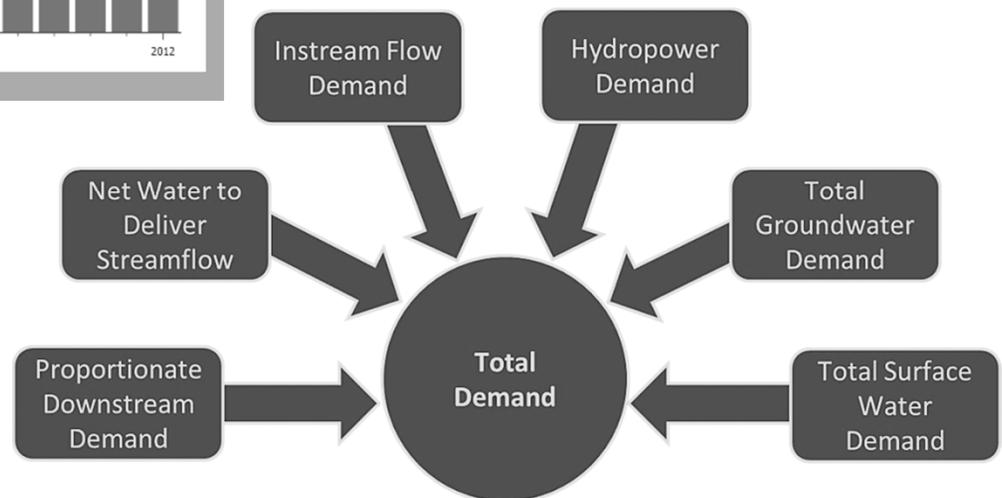
$$\text{BWS} = \text{Streamflow} + \text{Surface Water Consumption} + \text{Groundwater Depletion} + \text{Required Inflow}$$

Basin/Subbasin Data: Demand

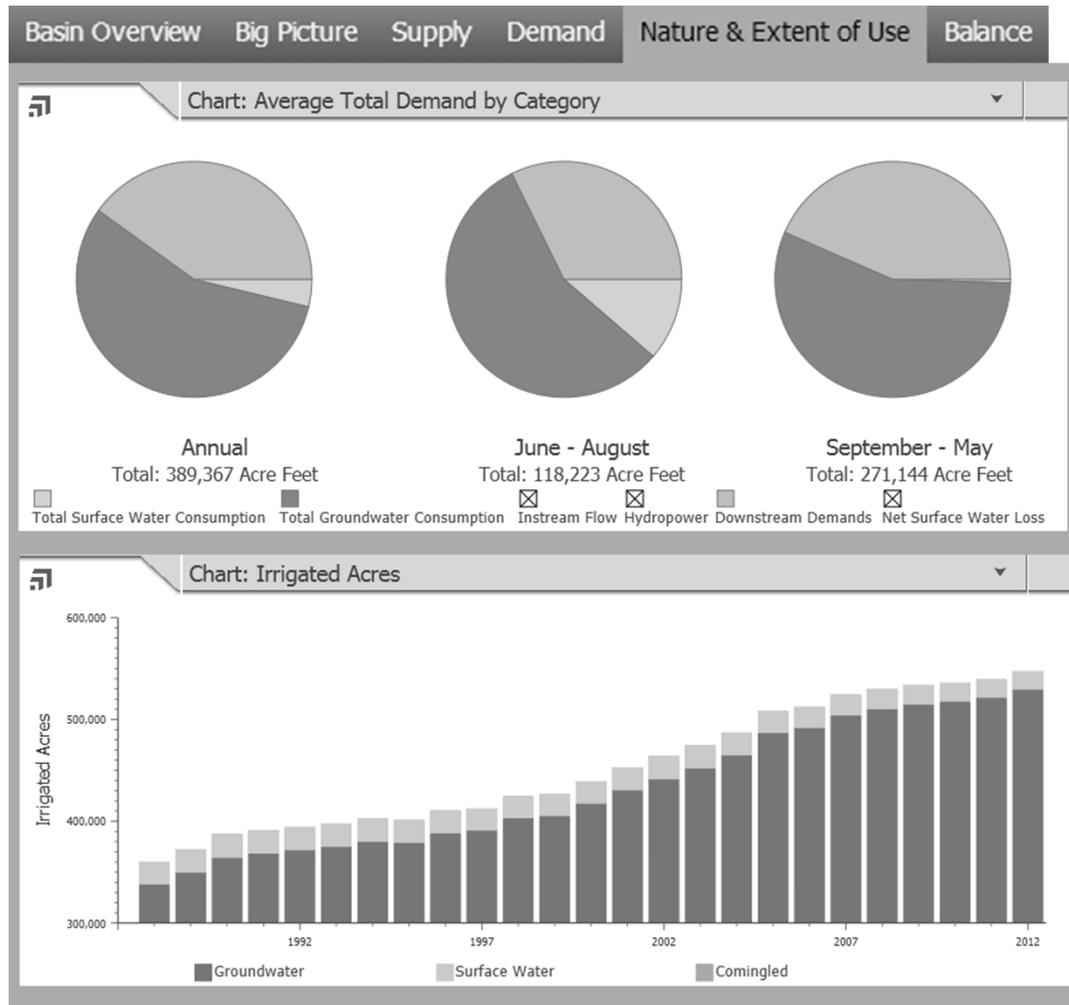
Total Demand



Includes six categories of water use



Basin/Subbasin Data: Nature & Extent of Use



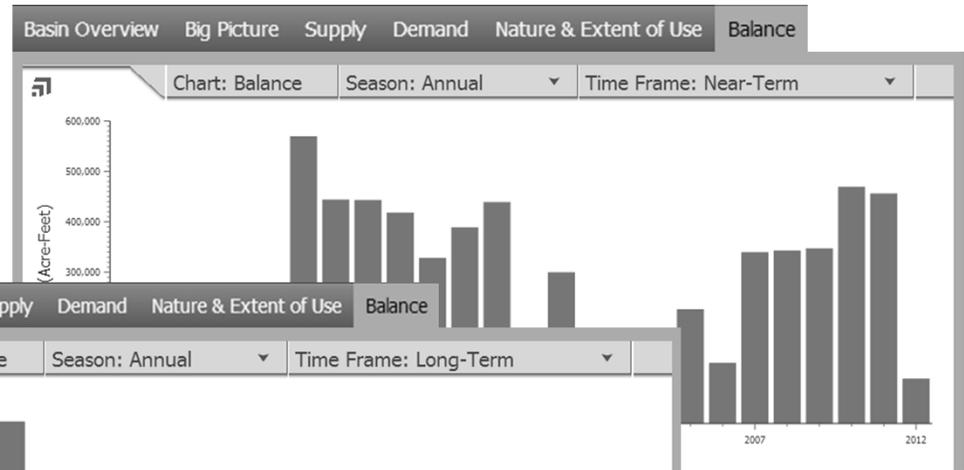
Average Long-Term
Total Demand by
Category

Irrigated Acres
by Source

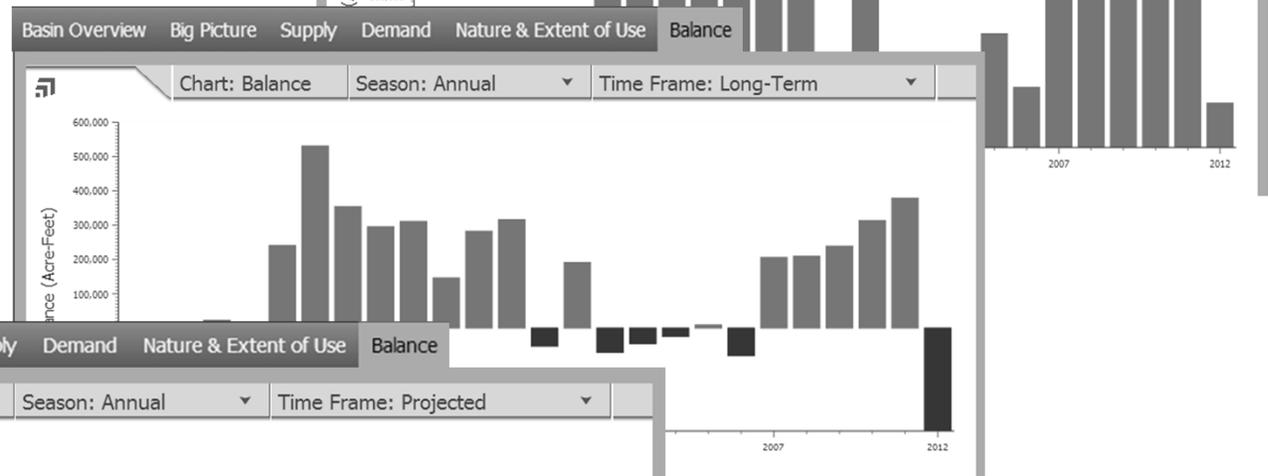
Basin/Subbasin Data: Balance of Water Supply and Demand

Balance of annual water supply and demand under three scenarios:

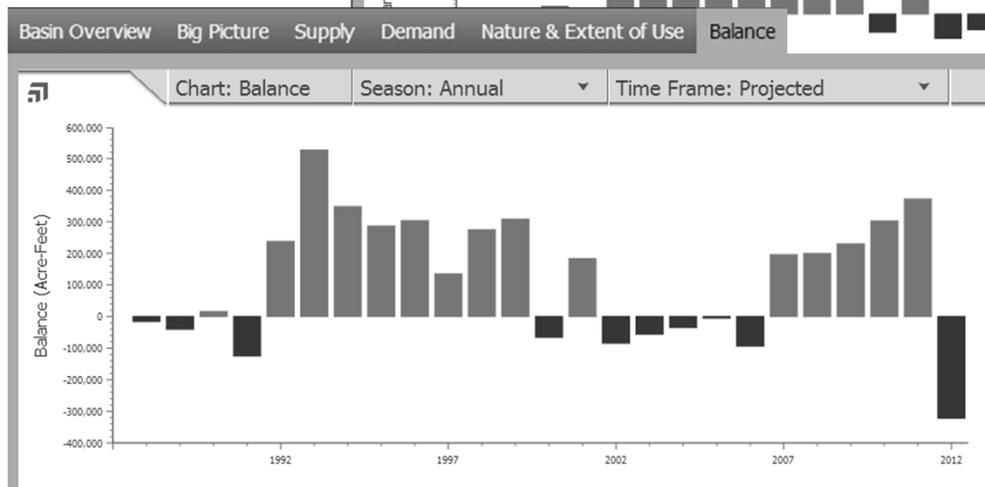
Near-Term



Long-Term



Projected Long-Term



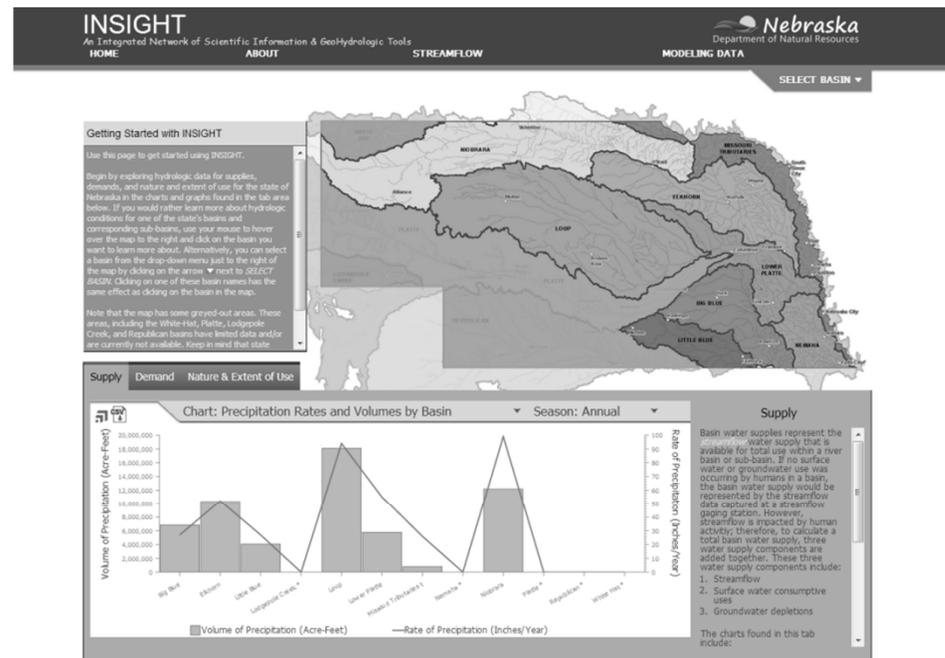
Balance =
Basin Water Supply –
Total Demand

INSIGHT:

**IMPLEMENTATION AND USE
IN PLANNING AND MONITORING**

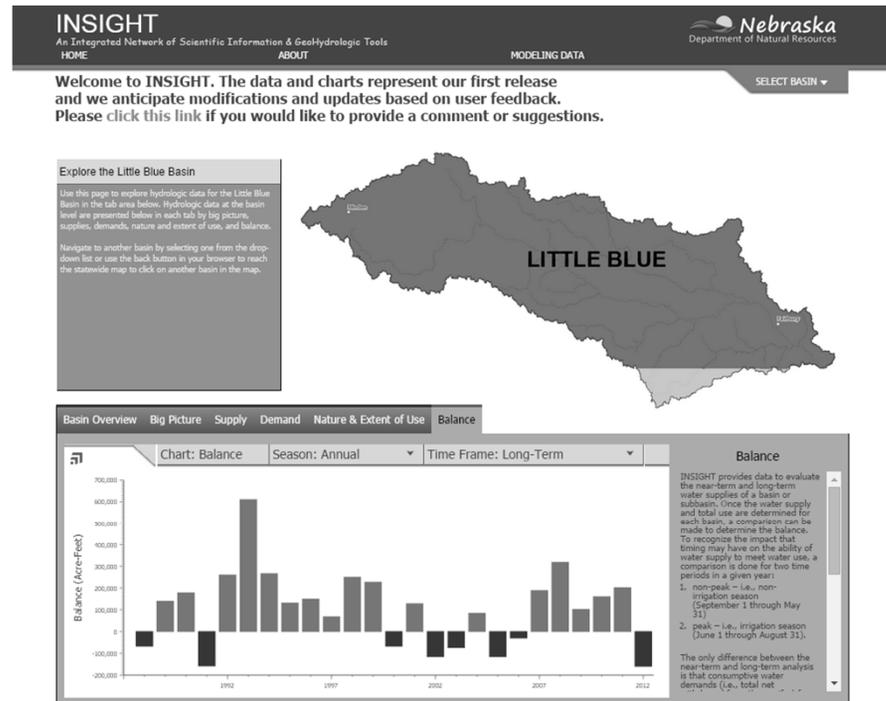
Benefits of INSIGHT

- Offers an easily accessible compilation of information about water resources across the state



Benefits of INSIGHT

- Allows users to weigh decisions based on the current and projected balance between supply and demand



INSIGHT and Water Management

- INSIGHT can help water managers:
 - ✓ Understand current and future demands
 - ✓ Evaluate the effectiveness of water management strategies
 - ✓ Assess critical areas of water shortage
 - ✓ Identify potential problems before they occur
 - ✓ Make proactive water management decisions



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