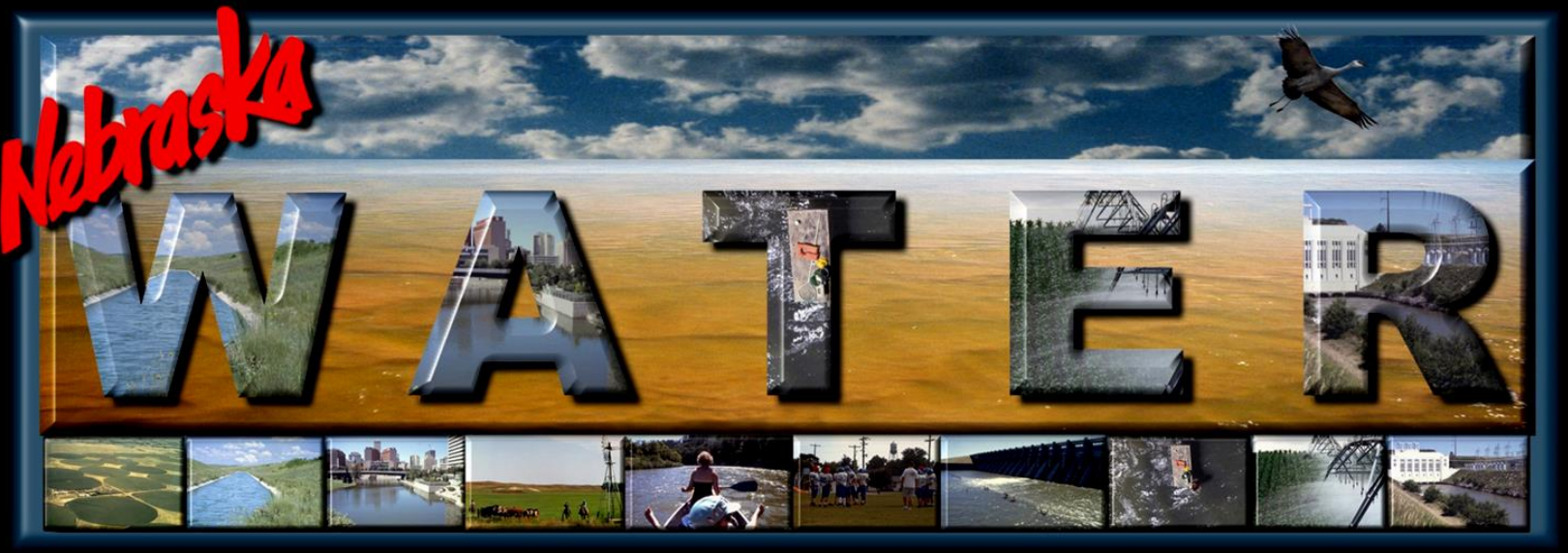

INSIGHT: A Web Based Tool for Quantification of Groundwater/Surface Water Interaction

Tim Freed, M.S.
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Nebraska Department of Natural Resources

June 9, 2015

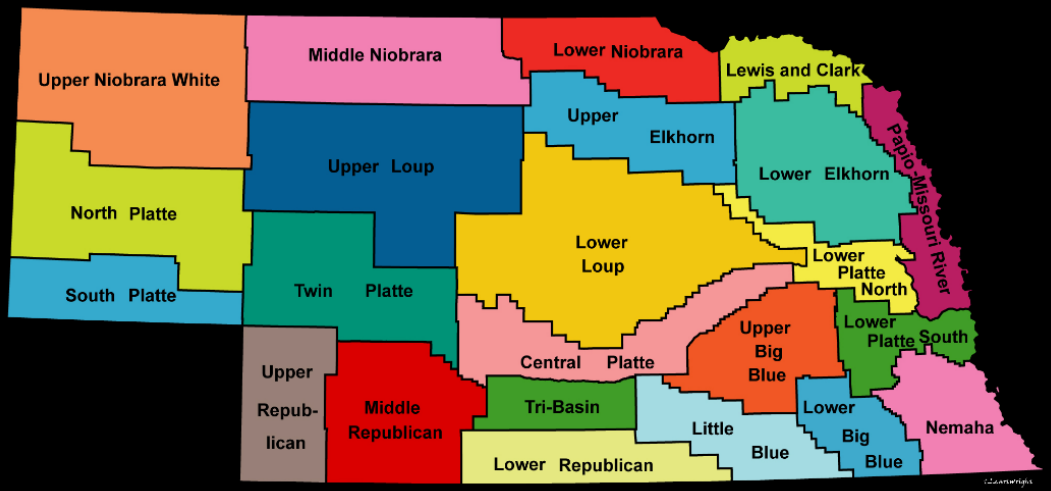
Nebraska
Department of Natural Resources

Overview

- Water Management Needs
- Data Inputs
- Output Data
- INSIGHT Web Tool

Water Management Needs

- Easily accessible information
  - Uniform
- Planning
  - IMPs
  - BWPs
- Monitoring
  - Stream flows
  - Groundwater Levels
  - Storage/Water operations



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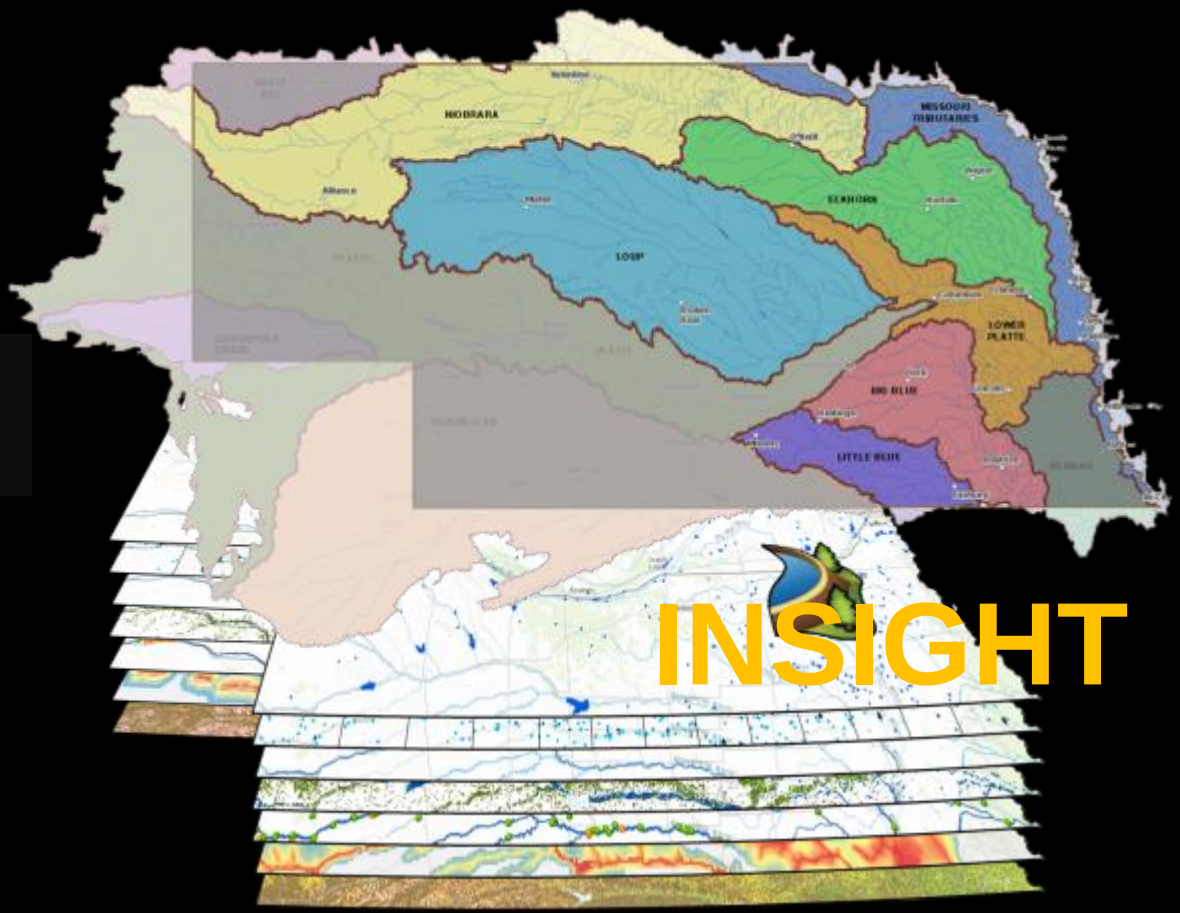
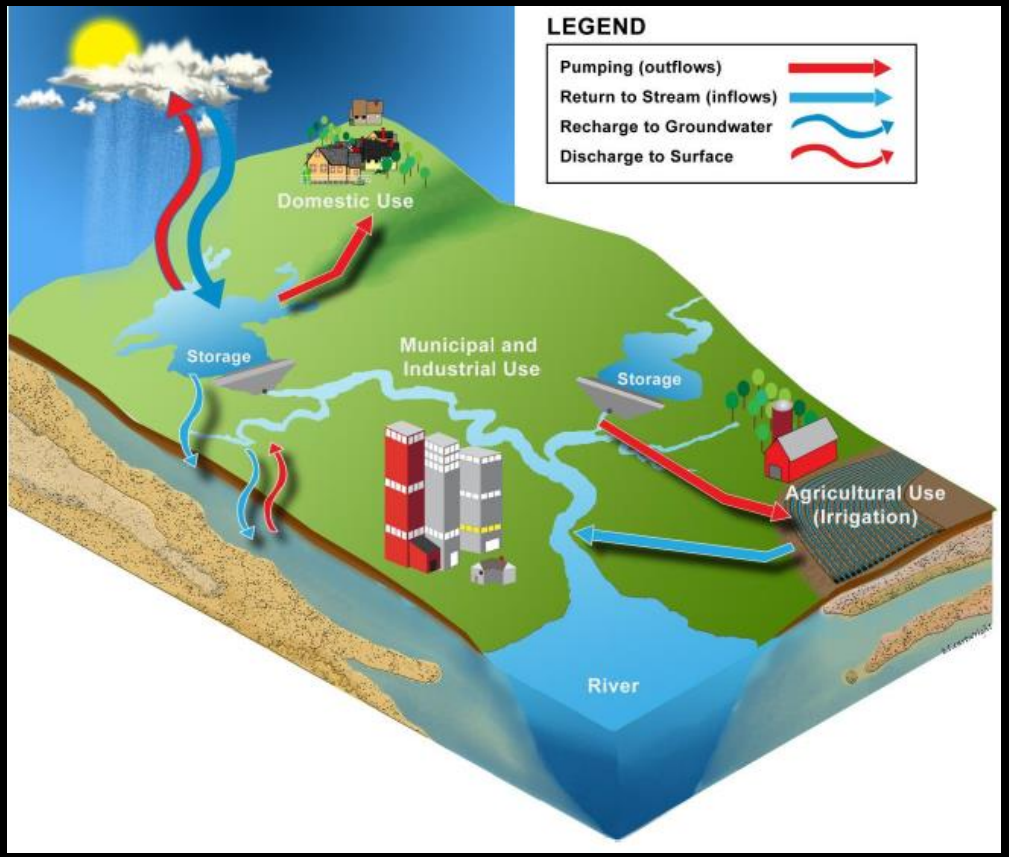
Multiple Stressors

Data Inputs



INSIGHT

Data Inputs



- Spatial Extent
  - Sub-basin
  - Basin
  - Statewide

Output Data

- Depletions/Hydrological Connection
- Basin Water Supplies
- Demands
- Balance

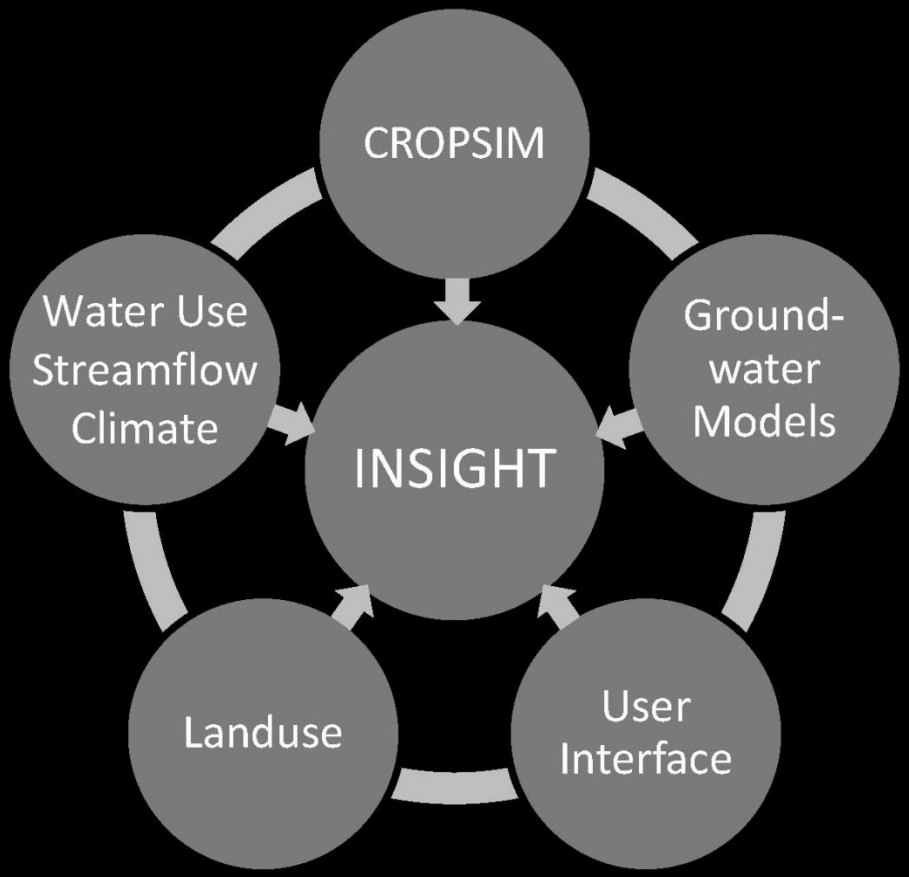
Balance = Basin Water Supply – Total Demand

INSIGHT:

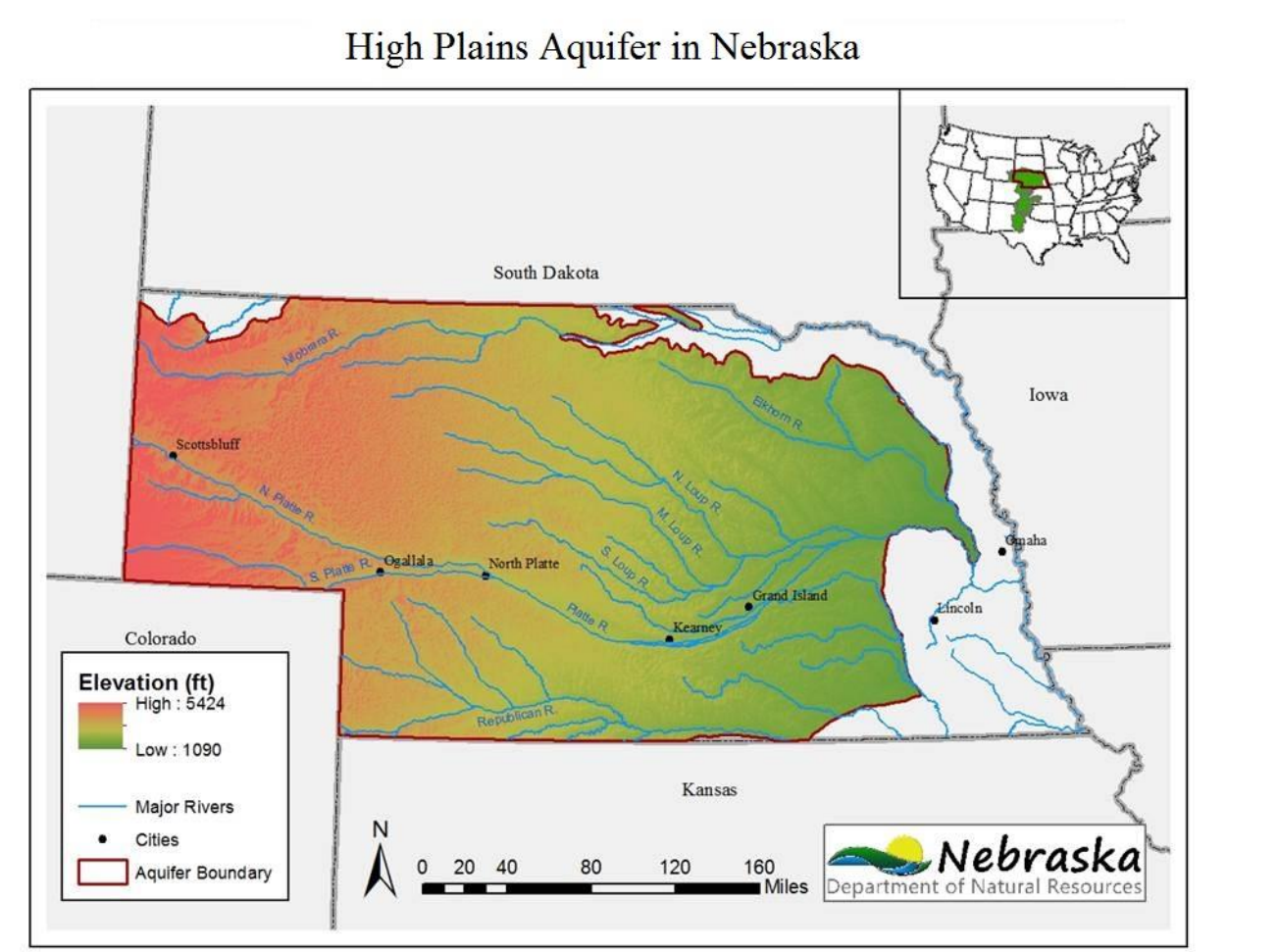
NEED & DEVELOPMENT

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

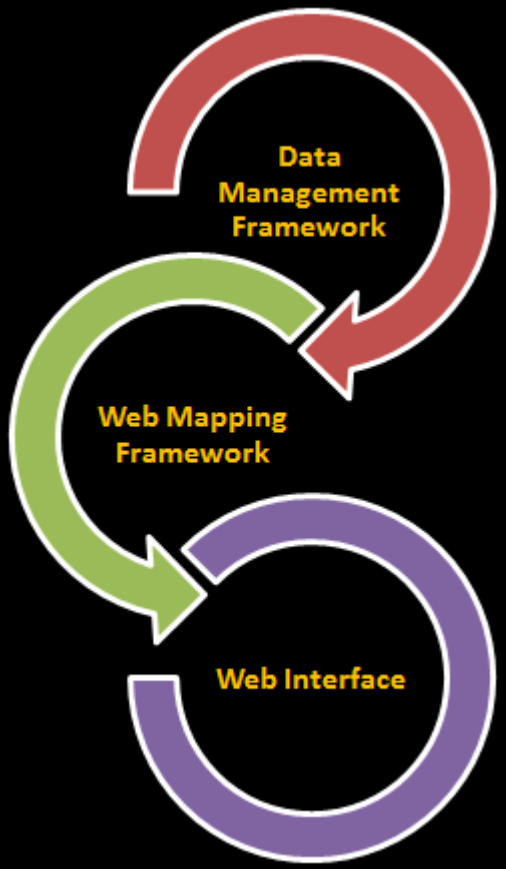


Hydrologic Connection



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

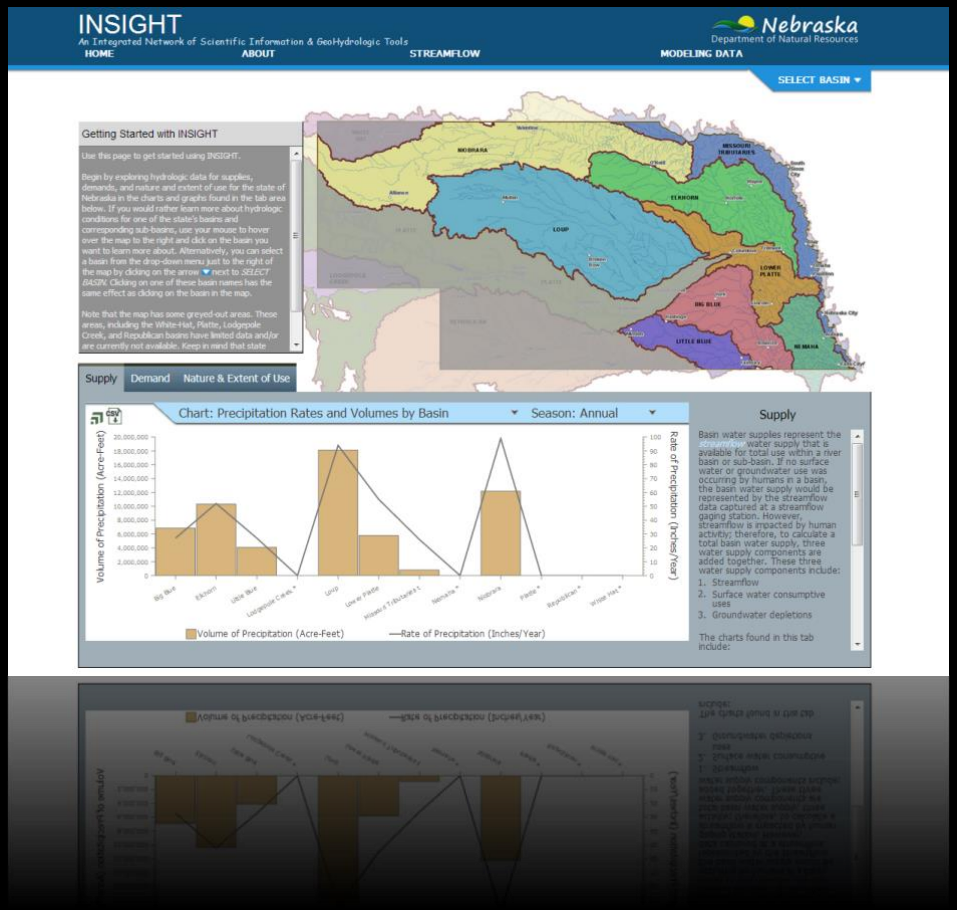
- Online Demonstration

INSIGHT:

IMPLEMENTATION AND USE IN PLANNING AND MONITORING

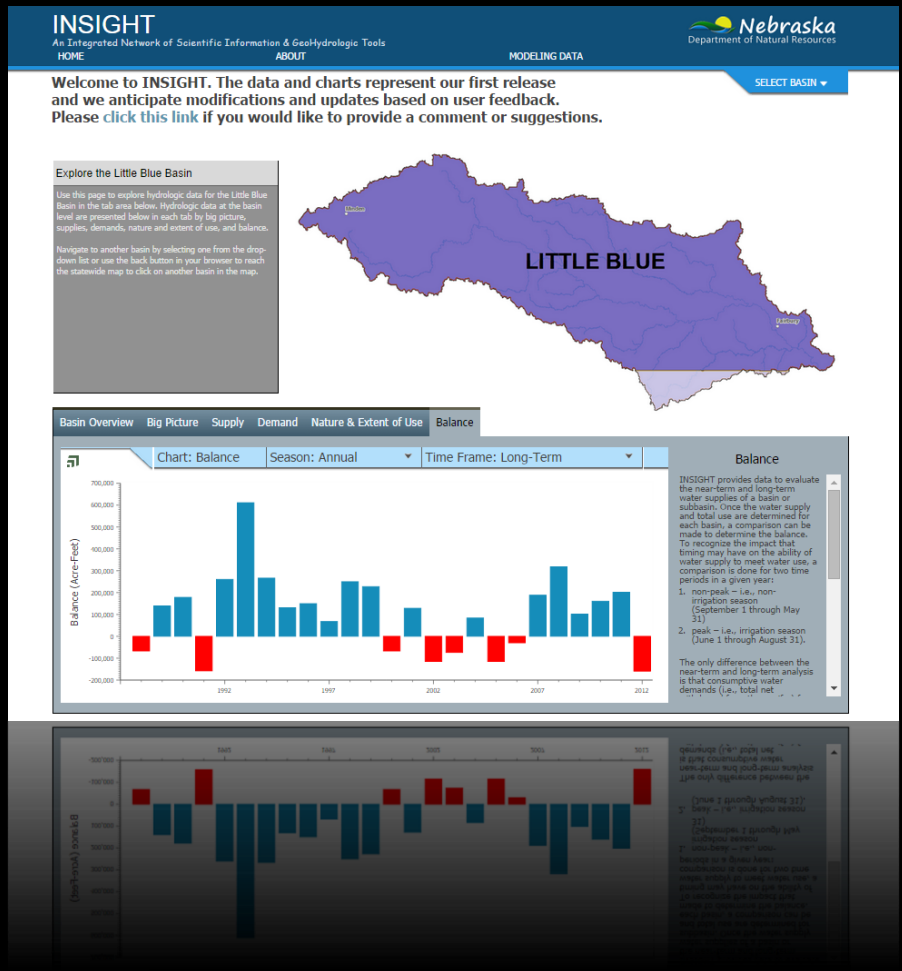
Benefits of INSIGHT

- Offers an easily accessible compilation of data and 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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Backup slides in case internet down

INSIGHT:

WHAT IT ENTAILS

Statewide Data

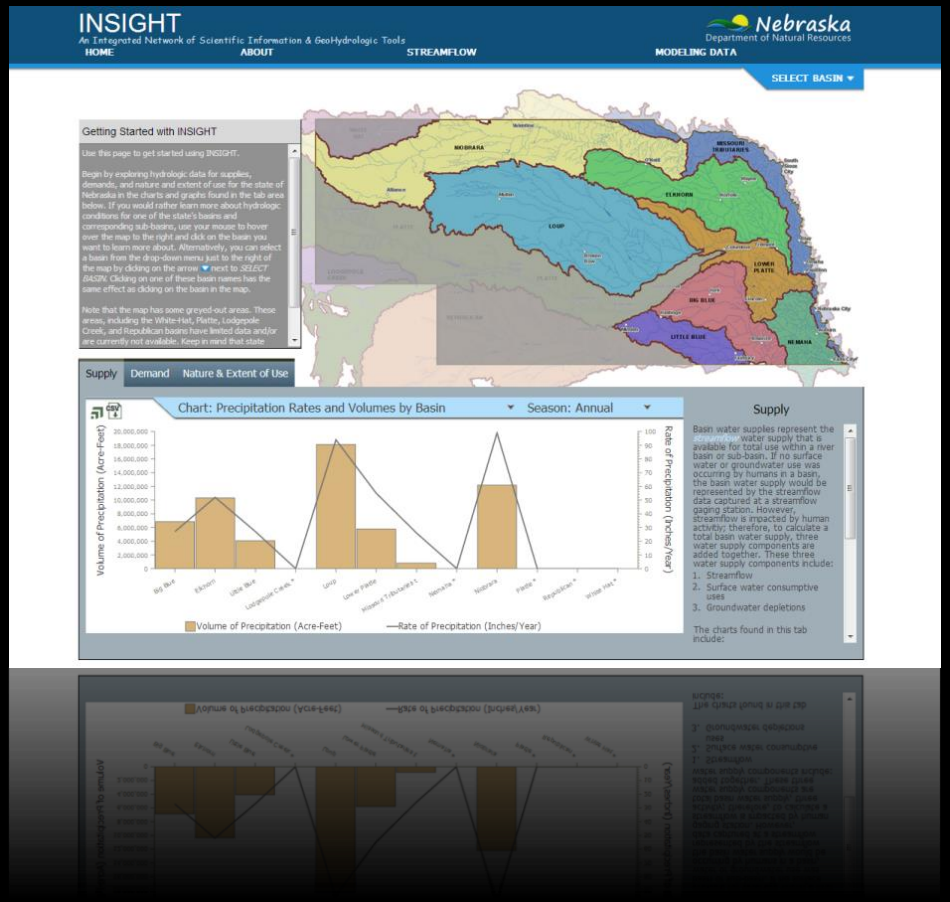
Basin-to-Basin Comparisons

Information available:

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

Seasons available:

- ✓ Annual
- ✓ Peak
- ✓ Non-Peak



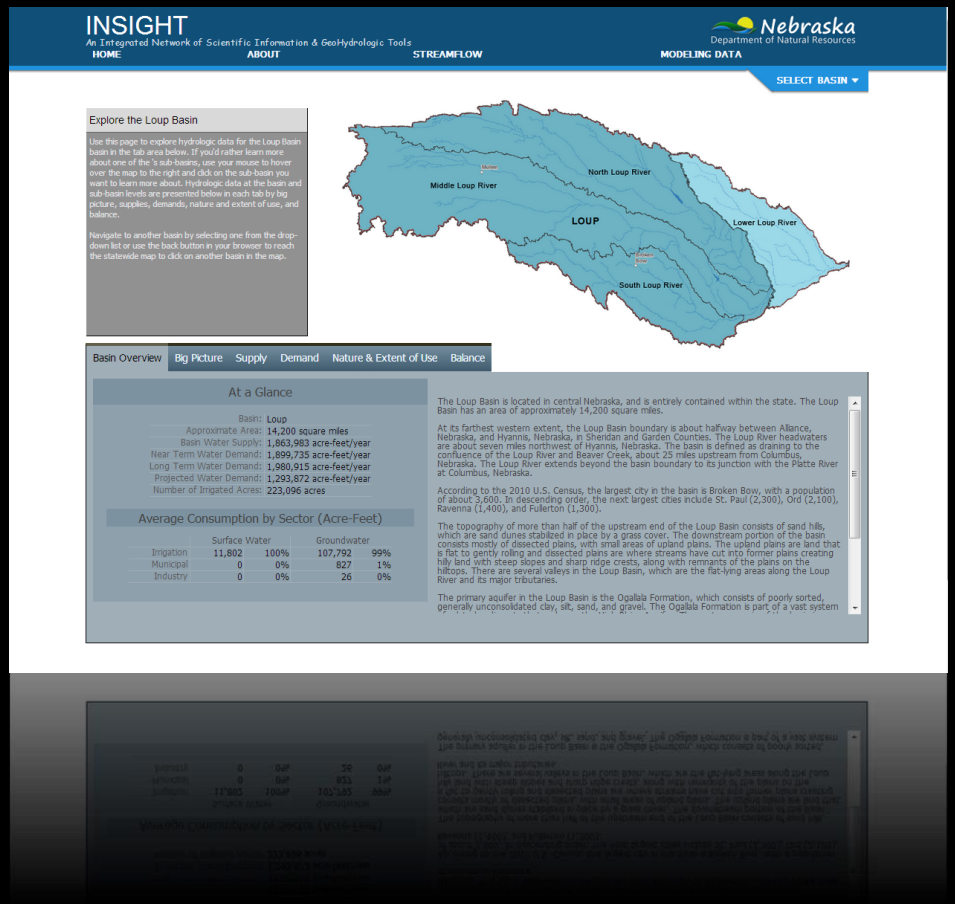
Basin & Subbasin Data
A More Detailed Picture

Information available

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

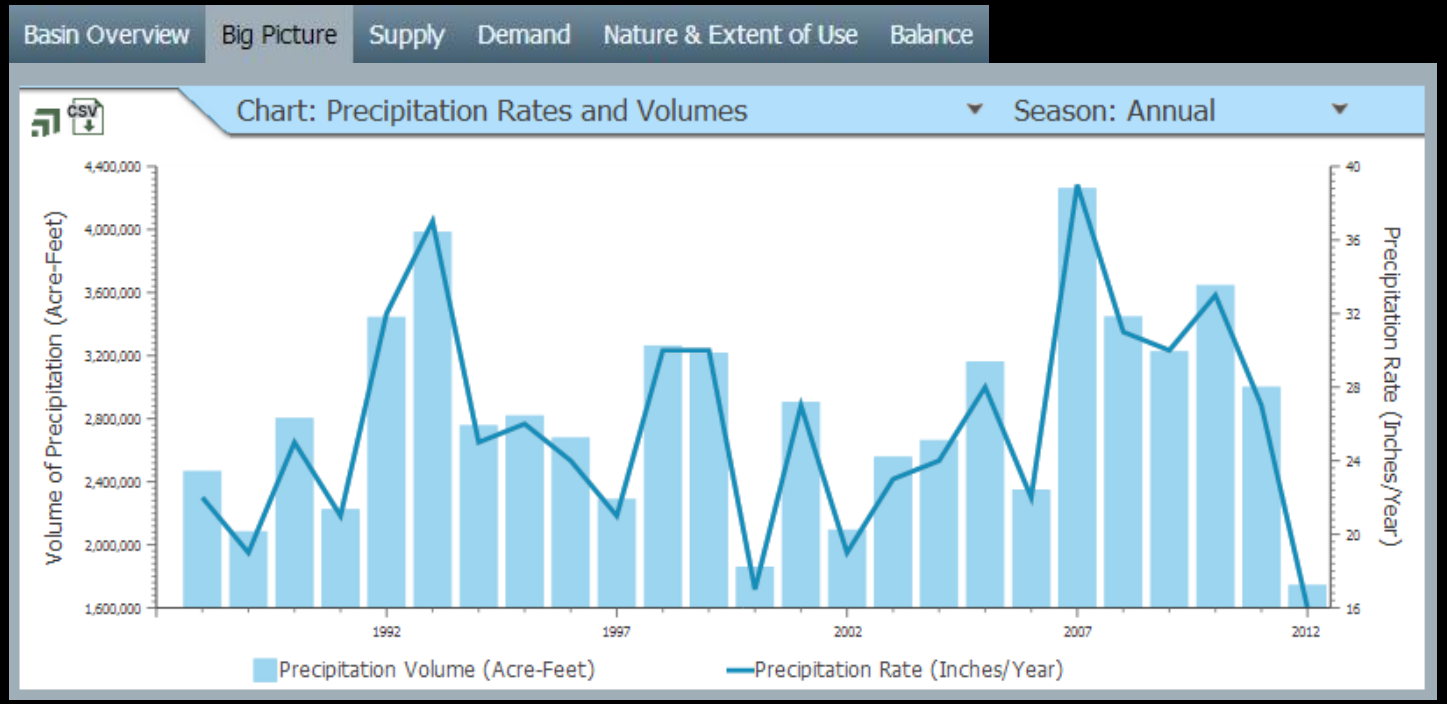
Seasons available

- ✓ Annual
- ✓ Non-Peak
- ✓ Peak

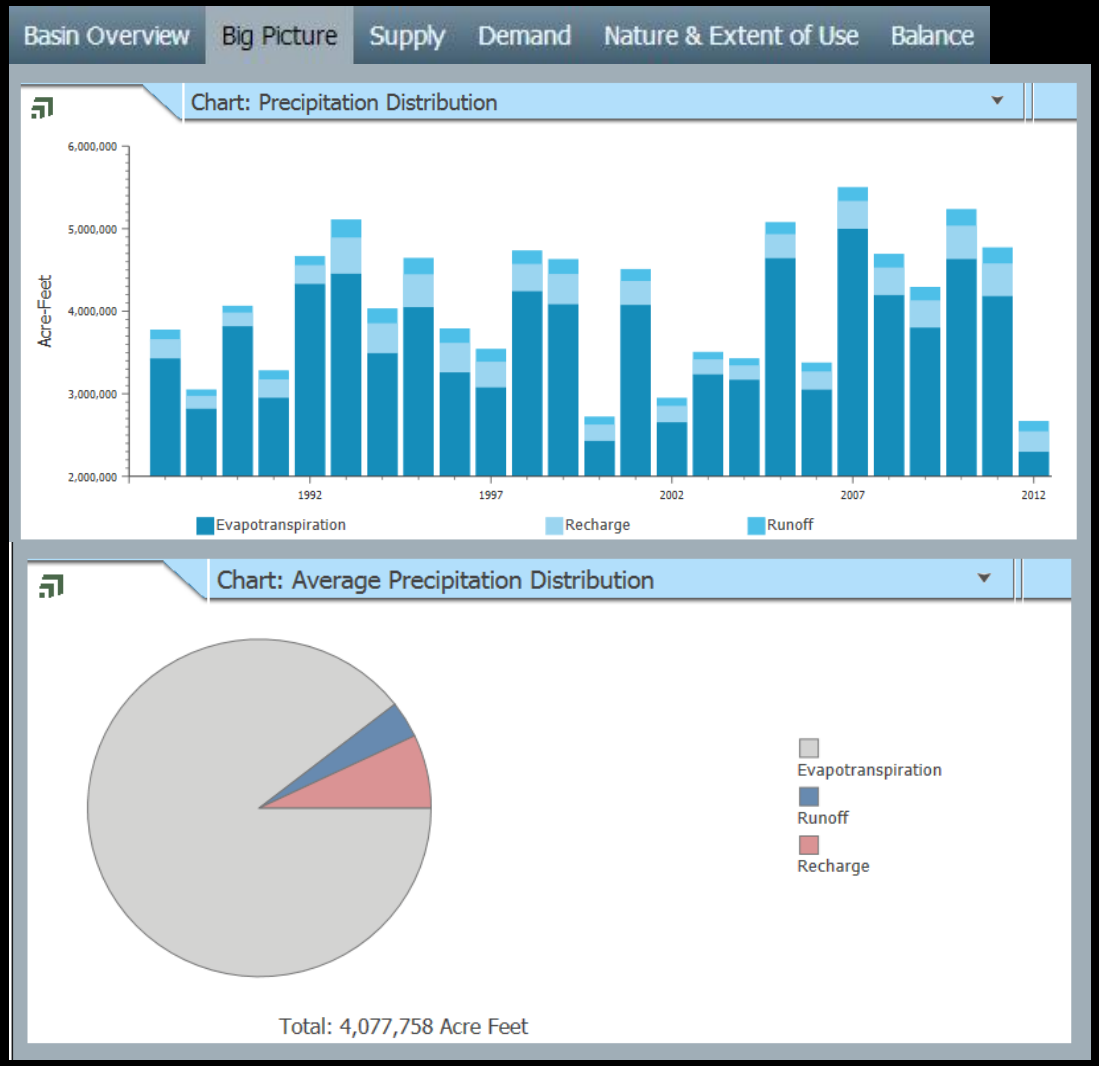


Basin/Subbasin Data: Big Picture

Precipitation Rates and Volumes by Basin



Basin/Subbasin Data: Big Picture

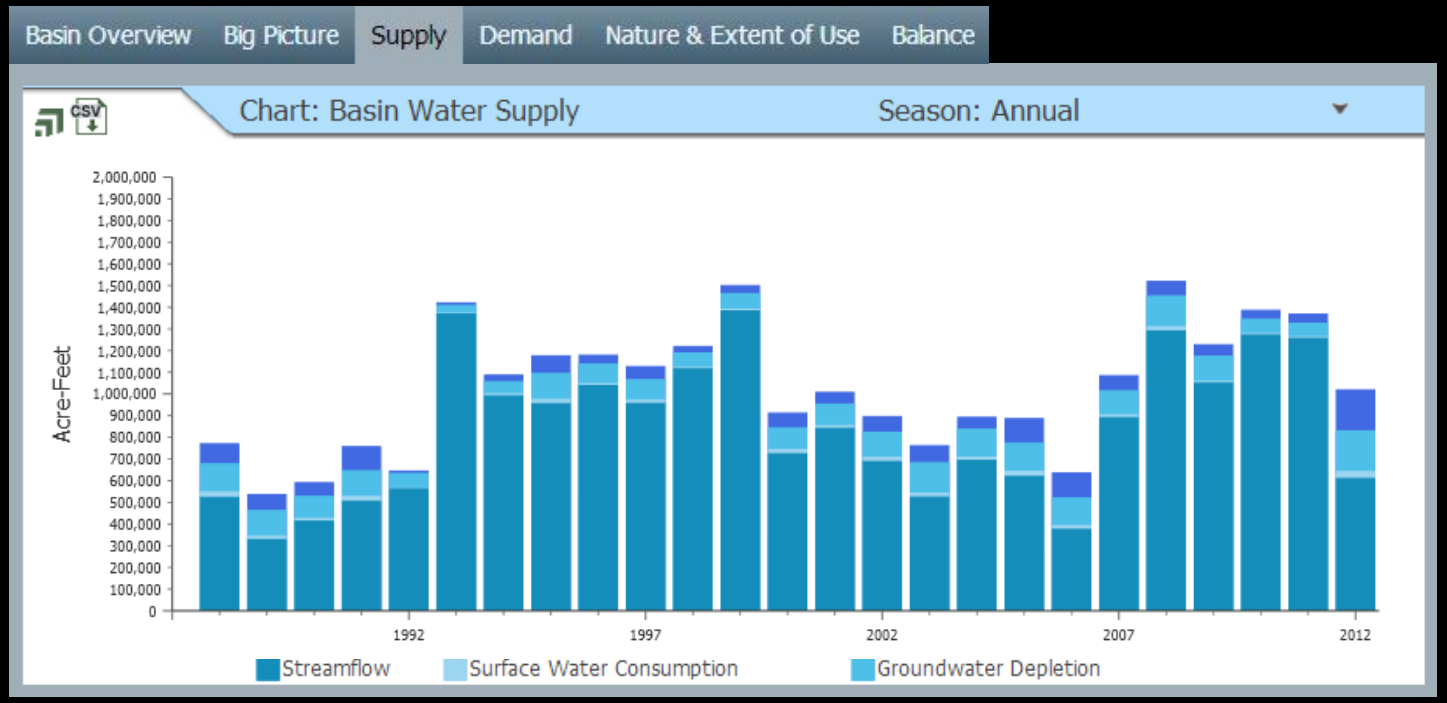


Precipitation Distribution

Average Precipitation Distribution

Basin/Subbasin Data: Supply

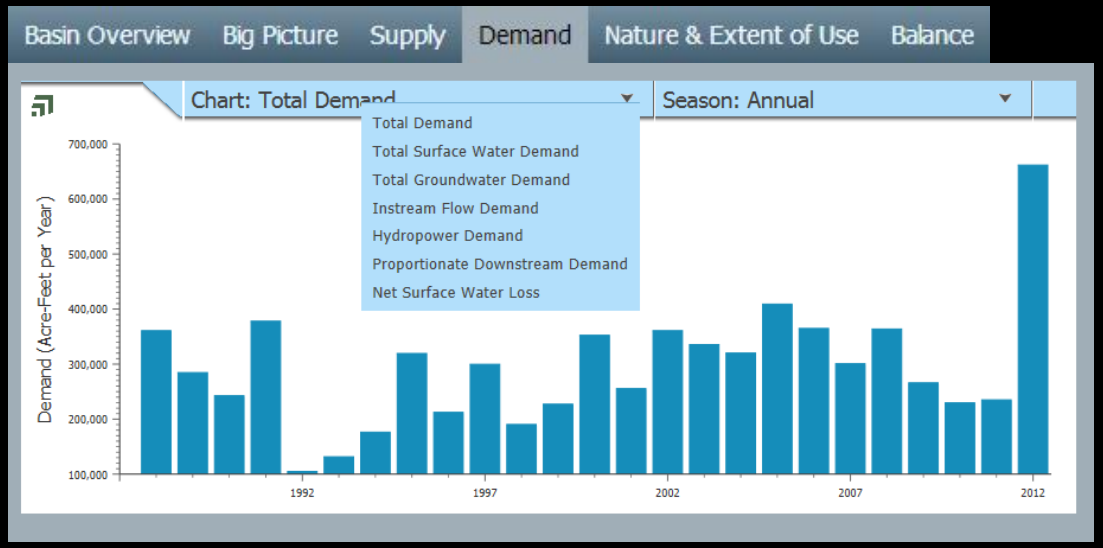
Basin Water Supply



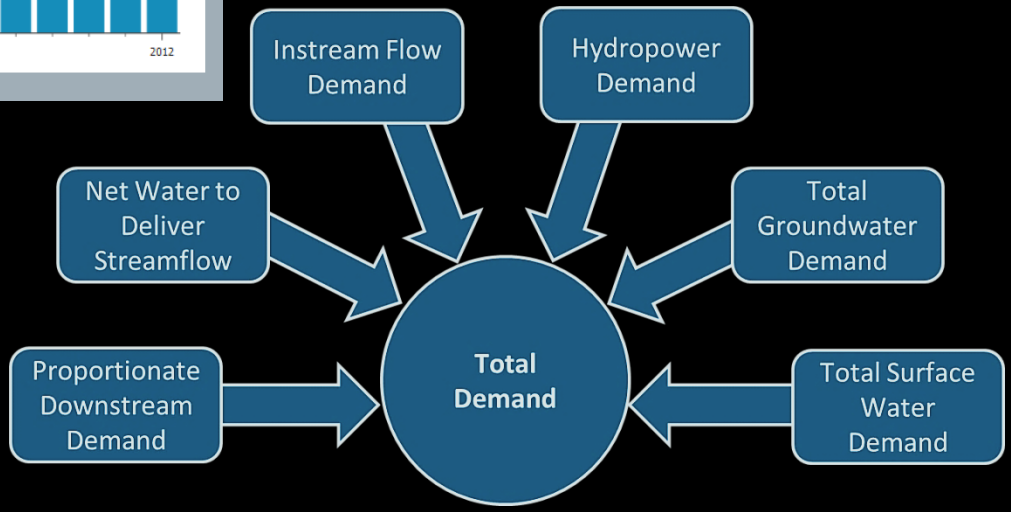
BWS = Streamflow + Surface Water Consumption + Groundwater Depletion + Required Inflow

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