# Long Term Water Supply Options for Oklahoma

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# How much will we need in the future?

# No one knows for sure!

- We don’t know for sure how much the population will grow.  We can calculate estimates but we cannot foresee the future.
- We don’t know for sure how much each person will use in the future.
- We don’t know which businesses and industries might be in the state or how much water they might use.
- We don’t know how quality issues or competition might affect our supplies.

# What should we do? How do we manage this uncertainty?

- Acquisition
- Conservation
- Enhancement
- Reuse and Recycling
- Diversification

# Acquisition – Ground Water

- Purchase land adjoining current holdings
- Lease or purchase water rights that adjoin current holdings
- Forming strategic partnerships among stakeholders that have a vested interest in ensuring future water supply or that could potentially have an unintended, adverse impact.

D1670 Rd
D3565 Rd
County Road 168
D3565 Rd
D1675 Rd

# Acquisition – Surface Water

- Protect potential lake sites
  - Conservation Easements
  - Purchase Land
  - Master Planning

# Conservation

- Leak detection and remediation
- Incentives for remodeling with low flow plumbing fixtures
- Amending the building code to require low flow plumbing fixtures in new construction
- Cisterns/Roof-Parking Lot Capture and Gray Water systems for lawn irrigation

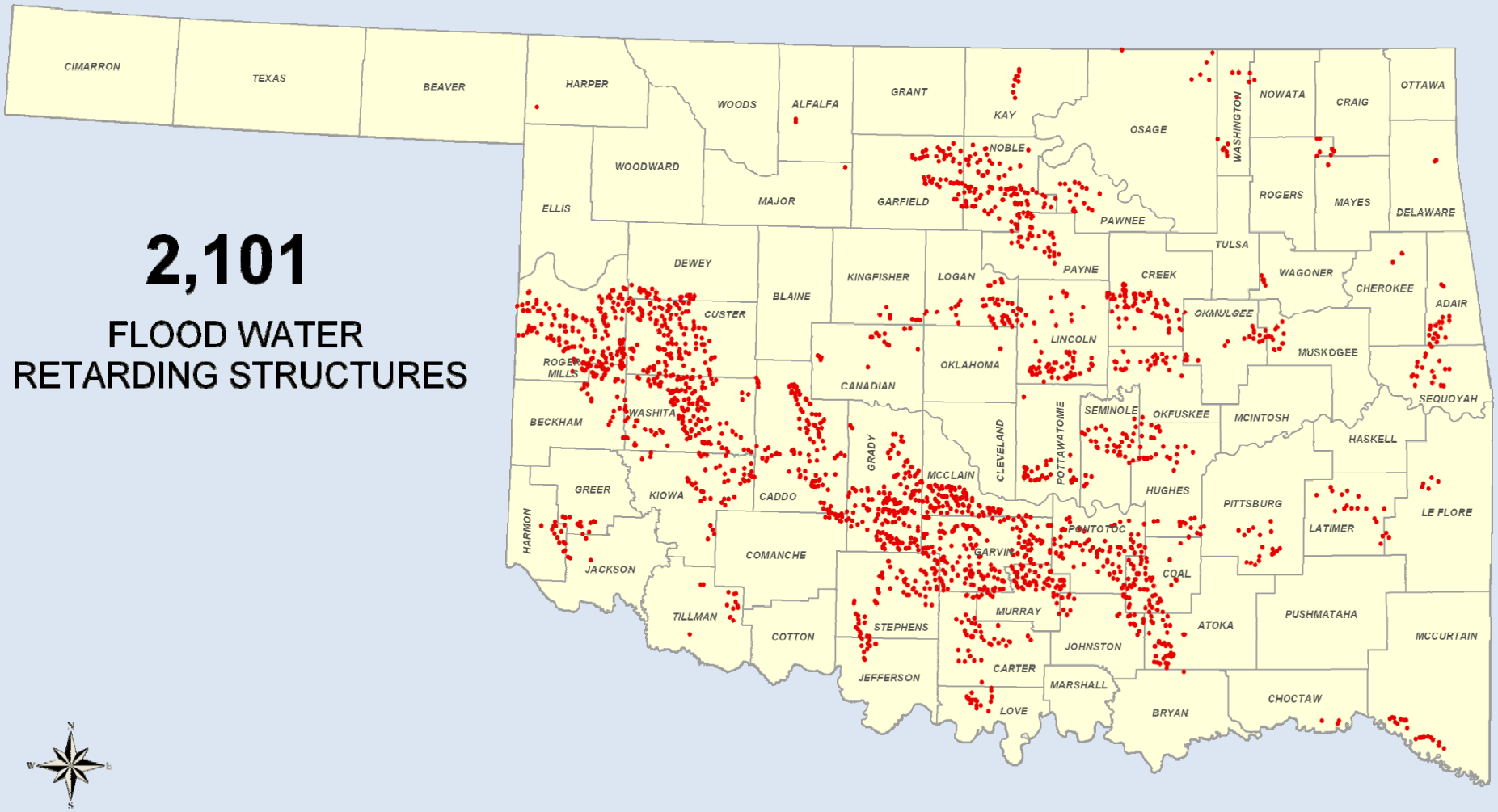
3:58 PM

# Enhanced Recharge

## OKLAHOMA'S WATERSHED PROGRAM

**2,101**

FLOOD WATER
RETARDING STRUCTURES

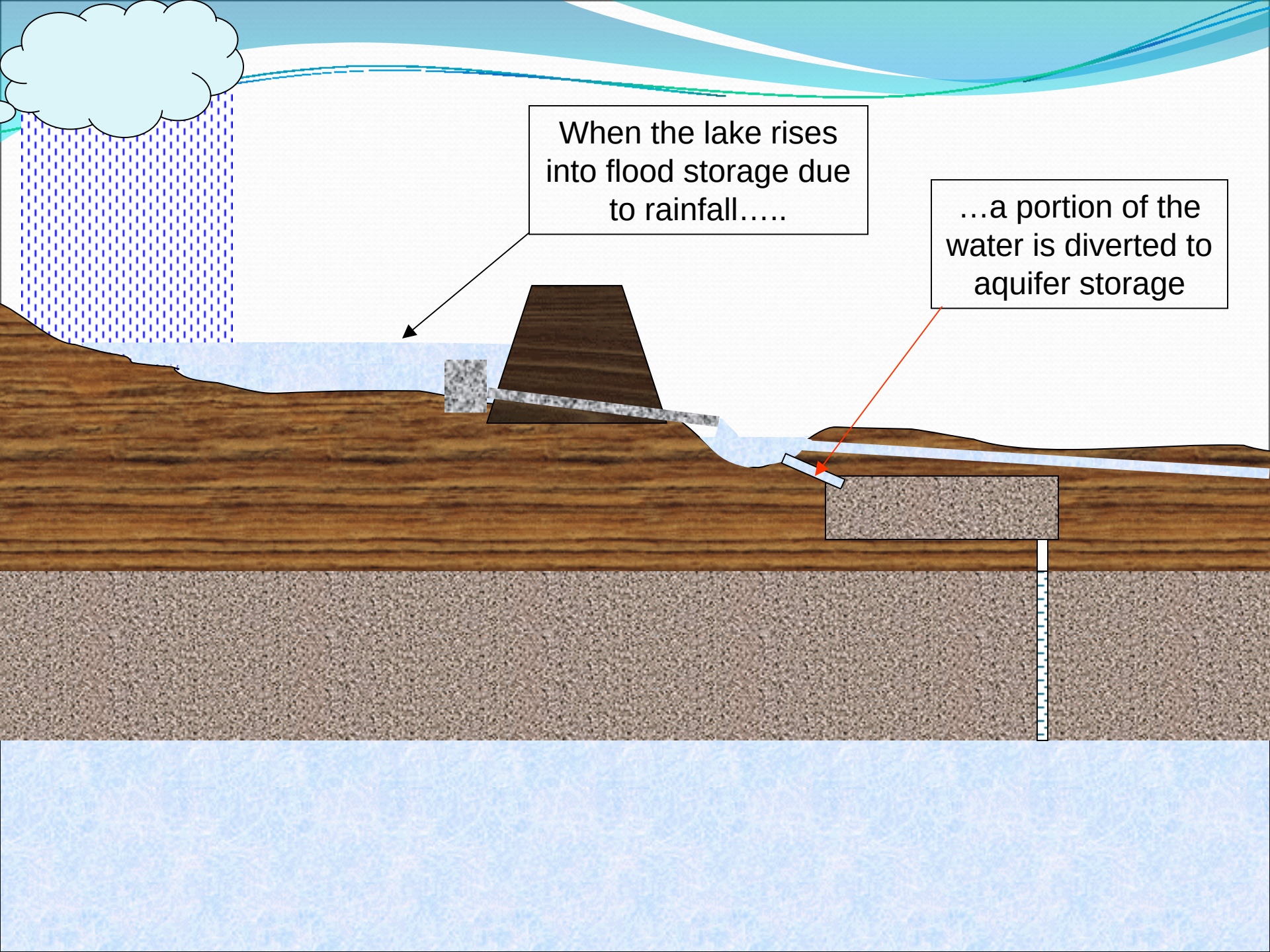



Watershed Structures

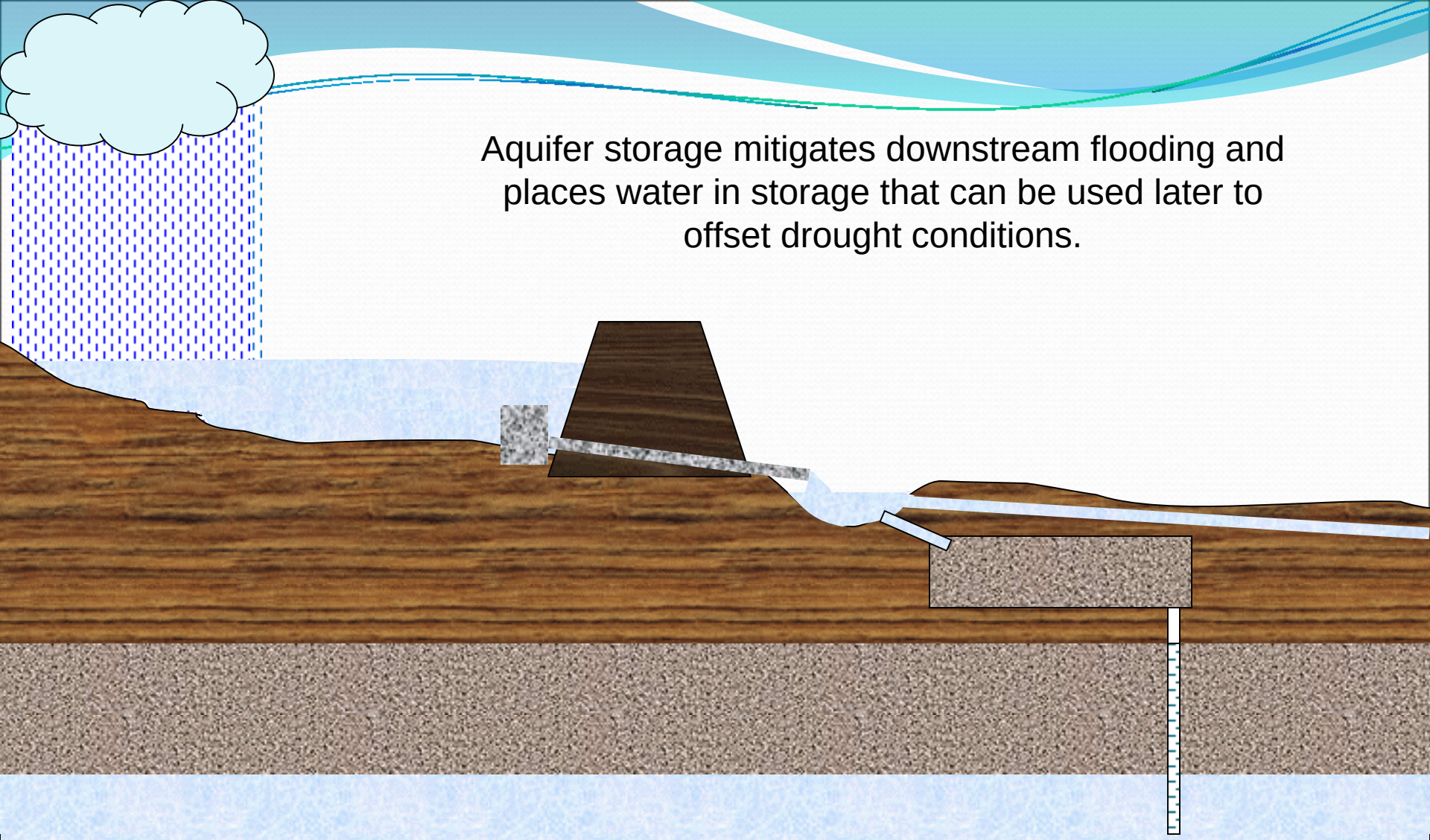
County Boundaries

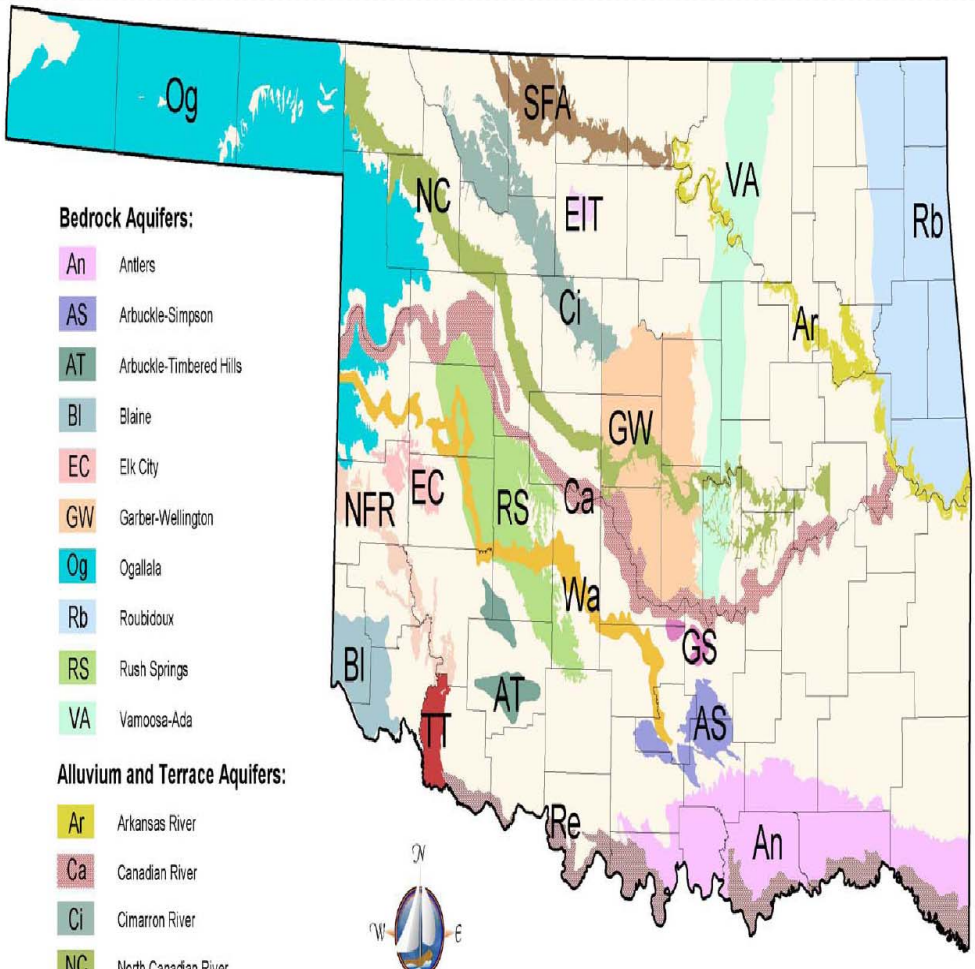
Oklahoma Conservation Commission
GIS Program

Map Produced: August 2005
OCC Map Number: 200500803-05

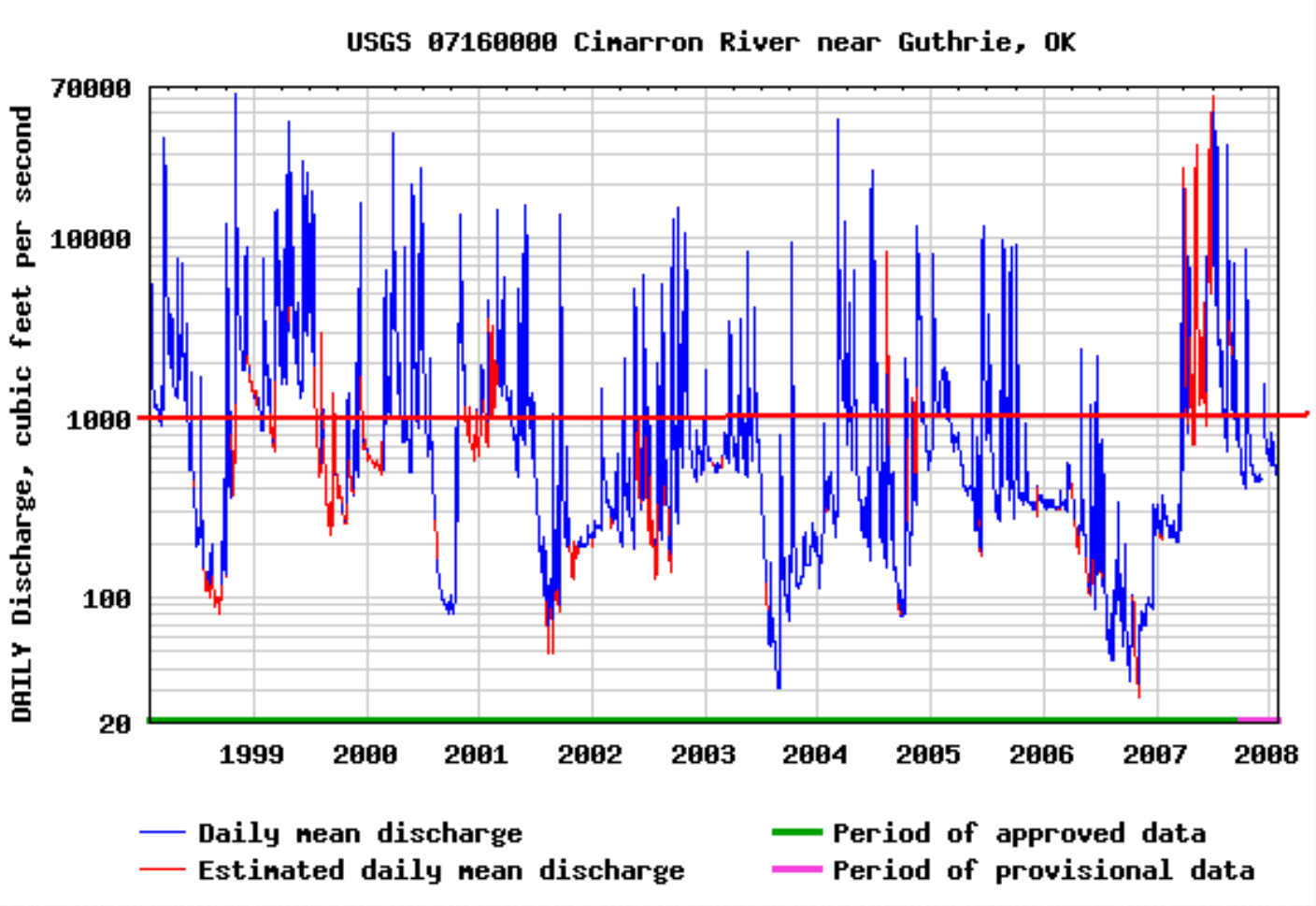

When the lake rises into flood storage due to rainfall…..
…a portion of the water is diverted to aquifer storage

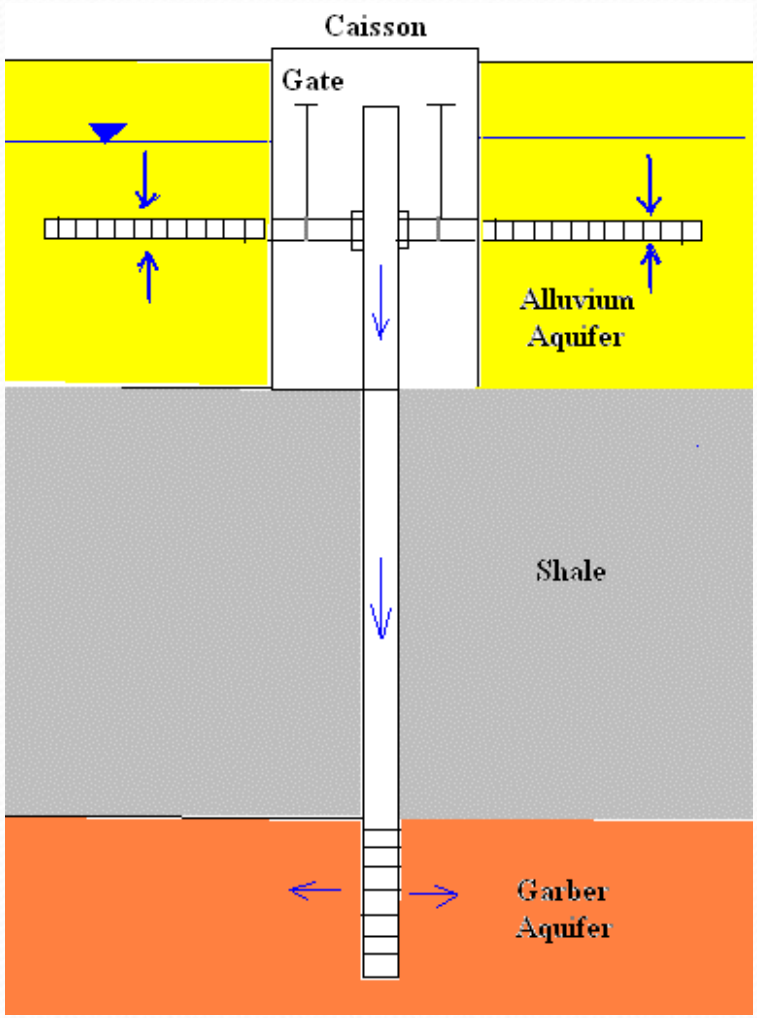
Aquifer storage mitigates downstream flooding and places water in storage that can be used later to offset drought conditions.



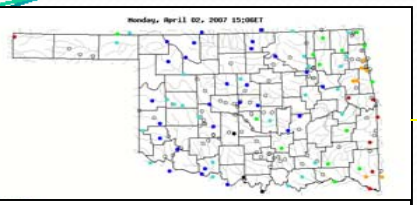



Map showing major aquifers in Oklahoma (Oklahoma Water Resources Board, March 2003).

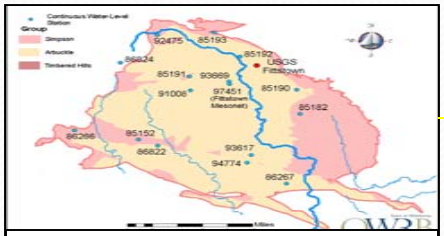

USGS 07160000 Cimarron River near Guthrie, OK
DAILY Discharge, cubic feet per second
70000
10000
1000
100
20
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
Daily mean discharge
Estimated daily mean discharge
Period of approved data
Period of provisional data


Caisson
Gate
Alluvium
Aquifer
Shale
Garber
Aquifer

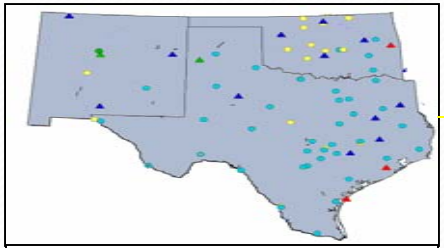
# Demonstration of an integrated watershed-scale water supply assessment and forecast system



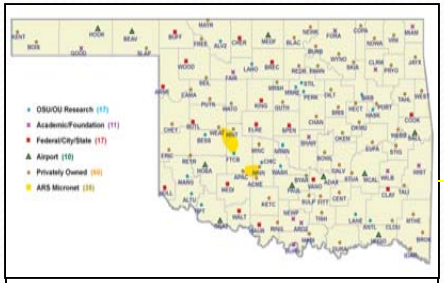
Stream Gauge Information



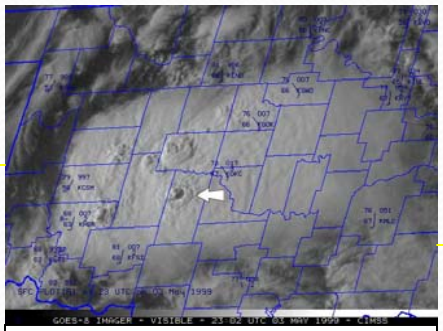
Groundwater Levels



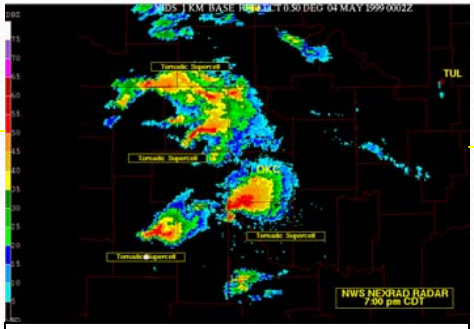
GPS Water Vapor and Wind Profilers



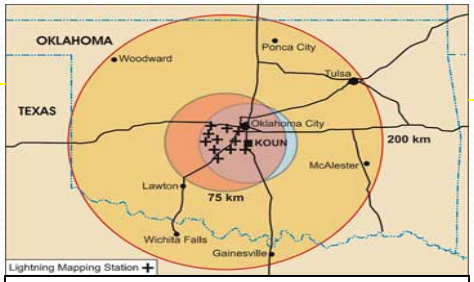
Surface and Subsurface *In-Situ* Weather and Soil Observations (Higher Spatial Resolution in Blue River Watershed)



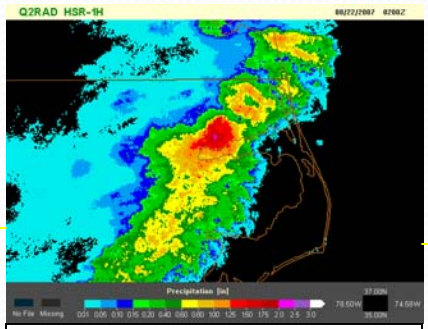
High-Resolution Satellite Data



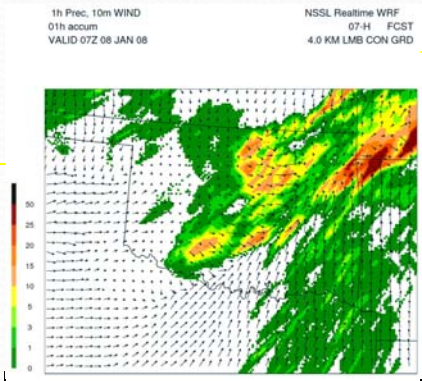

High-Resolution Radar Data (NEXRAD, DUAL-POL, Phased Array)



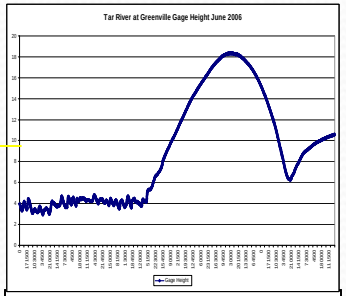

Lightning Data




Real-Time Automated QPE at 1 KM Resolution Every 5 Minutes




High-Resolution Numerical Weather Ensemble Predictions




An ensemble of hydrologic and hydraulic models will predict groundwater levels, surface water quantity, and water quality simulations for any user-defined point in the Blue River watershed

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

NATIONAL SEVERE STORMS LABORATORY

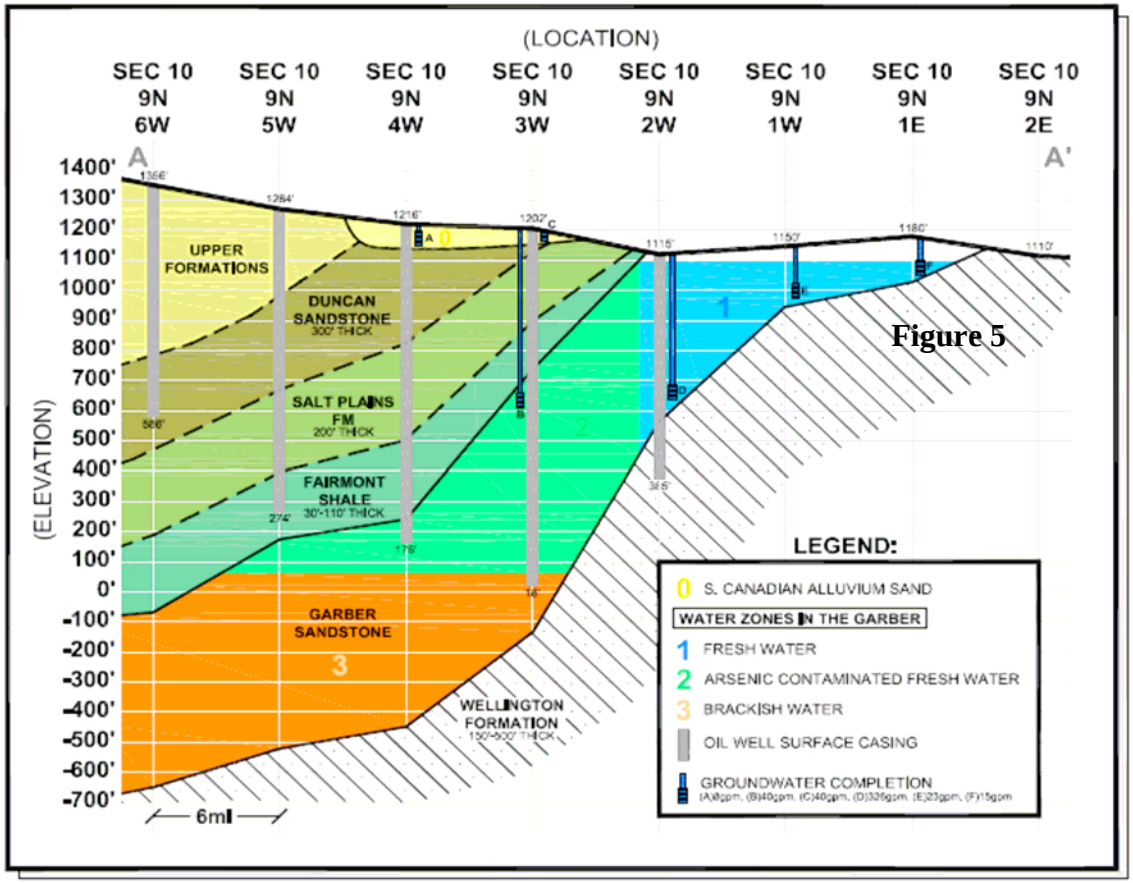
AWI AMERICAN WATER INSTITUTE

OKLAHOMA CLIMATOLOGICAL SURVEY

# Reuse and Recycling for Industrial and Commercial Uses

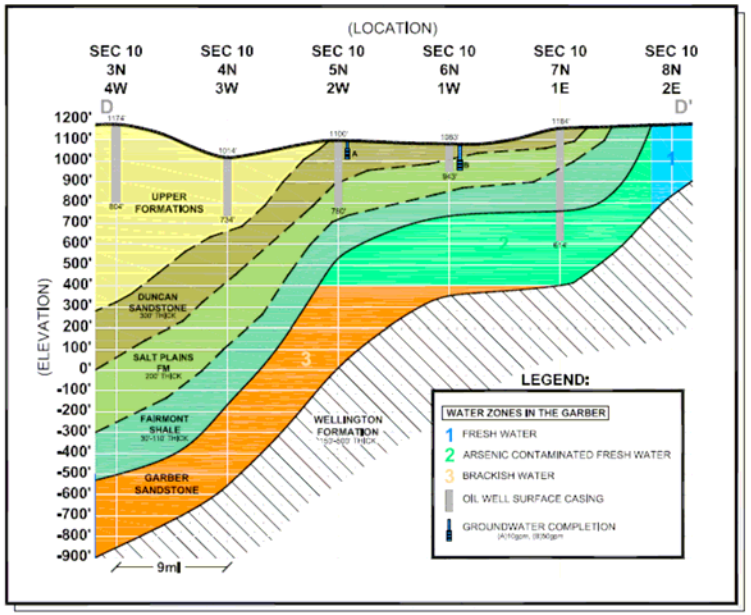
# Diversification

- Pipelines
- Brackish Ground Water
- New Lakes

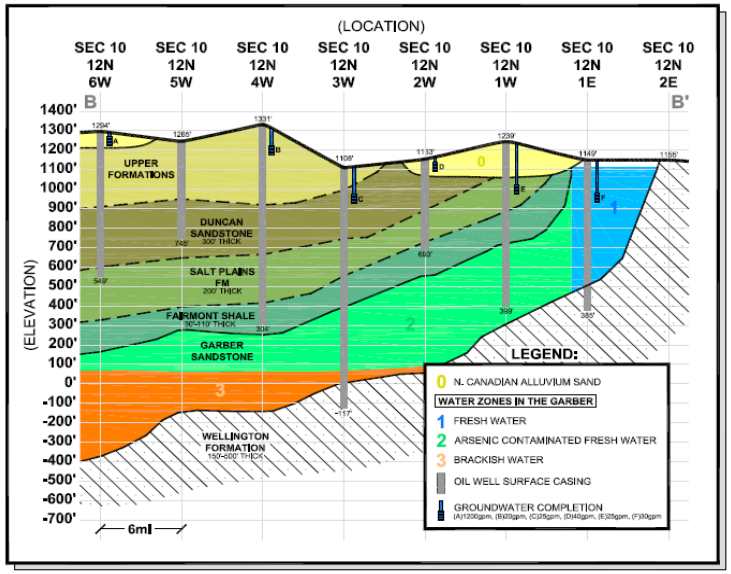



GENERALIZED CROSS-SECTION A-A'

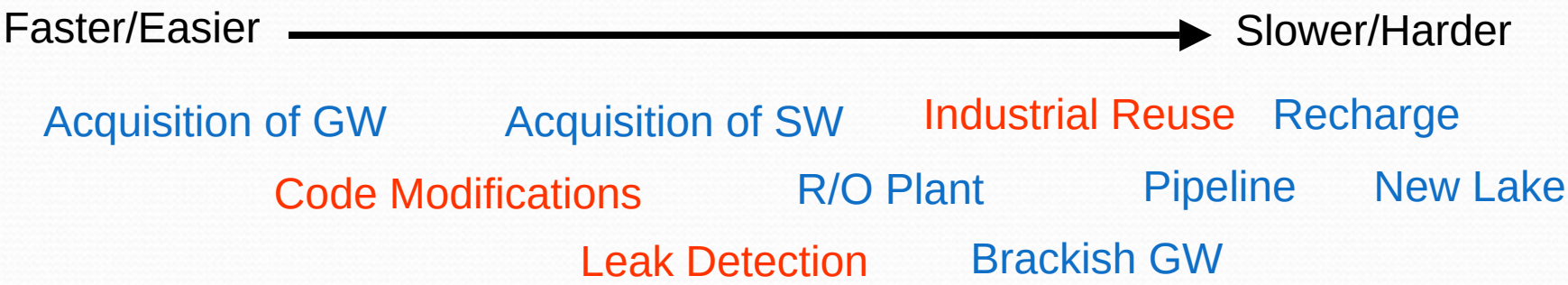
**Figure 5**




GENERALIZED CROSS-SECTION D-D'




GENERALIZED CROSS-SECTION B-B'

North Cameron Regional Water Project (2.25 MGD @ $5M)

# Evolution of Water Supplies