Project Background

- USGS Water Science Centers Involved
  - Arkansas - 32
  - Louisiana - 50
  - Oklahoma - 25
  - Texas - 35
Project Background

• SECURE Water Act (2007)
  – National Science and Technology Council
  • National Water Census
Project Background

• USGS – Strategic Direction

“A water census for the US: Quantifying, Forecasting and Securing Freshwater for Americas Future.”
Study Goals

• One Strategy
• Focus on Water Availability
• Answer the Questions:
  – Is there adequate quantity of water, with sufficient quality and timing-characteristics, to meet both human and ecological needs?
  – Will this water be present to meet both existing and future needs?
Study Area

- Area - 93,200 mi²
- Population – 4.3 million
- Precipitation – 30”-50”
- USGS & Cooperators > $4 million
Issues

• Increasing Water Demands
• Ongoing Drought
• Disruption of Aquatic Ecosystems
Planned Activities

1. Water-use Estimates
2. Groundwater/Surface Water Interaction
3. Estimate Daily Streamflows/Temps
4. Ecological Flows
Planned Activities

1 - Refine 2010 USGS Water-use Estimates

- HUC -8
- Consumptive use
- Irrigation
- Interbasin
- Returns
Planned Activities

1 - Refine Water-use Estimates

• Groundwater
  – Seymour
  – RR alluvial

• Surface Water
  – 1980-2014
Planned Activities

2 – Groundwater Model

- Develop a model (MODFLOW)
  - Upstream of Denison Dam
  - SW/GW interaction
  - Additional withdrawals
<table>
<thead>
<tr>
<th>Aquifer</th>
<th>Project dates (federal fiscal year)</th>
<th>Publication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tillman Terrace</td>
<td>Not scheduled</td>
<td>NA</td>
</tr>
<tr>
<td>Red River alluvial aquifer</td>
<td>Not scheduled</td>
<td>Oklahoma Water Resources Board (2012)</td>
</tr>
</tbody>
</table>
Planned Activities

3 - Estimate Daily Streamflows

• Precipitation Runoff Modeling System (PRMS)
  – Predict flows in ungaged area
  – Future projections
  – Couple with GW model
Planned Activities

4 – Ecological Flows

• Temperature regimes and fishes
• Changes in fish assemblages
• Altered landscape fisheries
Select Stakeholders

- U.S. Department of the Interior
- U.S. Geological Survey
- Department of Transportation & Development
- Red River Valley Association
- Red River Compact Commission
- NRCS Earth Team
- State of Oklahoma
- Water Resources Board
- Texas Water Development Board
- U.S. Fish & Wildlife Service
- US Army Corps of Engineers
- Bureau of Reclamation
- Arkansas, Louisiana, Oklahoma, Texas