

Groundwater Monitoring in Oklahoma

*Western Governors' Association
Western States Water Council*

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**Monitoring Well & Hog Barns
Kingfisher County, Oklahoma**



**Antelope Hills, Ogallala Formation
Roger Mills County, Oklahoma**

Groundwater Quality Monitoring

- Furtive stabs and attempts at monitoring have been offered.
- 300,000 self-supplied users in OK. Do they know enough to care?
- Is source water protection enough?
- Should future water supply projections include a GW component if the Quality of GW is ignored?

How Did We Get Here?

- ✓ No Holistic Groundwater Strategy
- ✓ Public versus private (Access & Rights)
- ✓ Don't Ask, Don't Tell (When we look, we usually find something)
- ✓ State Role?
- ✓ Federal Role?
- ✓ What is the public's expectation?

Groundwater Resources of Oklahoma Discussion

- 21 Major Aquifers Store ~160 million acre-feet of groundwater.
- 90% of irrigation/25% of drinking needs water met by groundwater.
- Groundwater is under-utilized, under-appreciated and under protected. Is groundwater like oil or timber?
- The High Plains Ogallala aquifer in Oklahoma's Panhandle is an exception. Long-term withdrawals have diminished groundwater storage and affected surface flows in the Panhandle Region.
- Groundwater depths in the state vary from less than 2 feet to greater than 340 feet below land surface.

Groundwater Resources of Oklahoma Discussion

- ✓ Groundwater vulnerability is variable.
- ✓ Maximum Annual Yield Versus Safe Yield
- ✓ Oklahoma Water Law does not recognize hydrologic connection between groundwater and surface water.
- ✓ Fact: On a hot summer day in the Oklahoma Panhandle, it has been estimated that more groundwater is pumped for irrigation from Texas County alone than what is consumed on a like day by the entire NYC metropolitan area population.

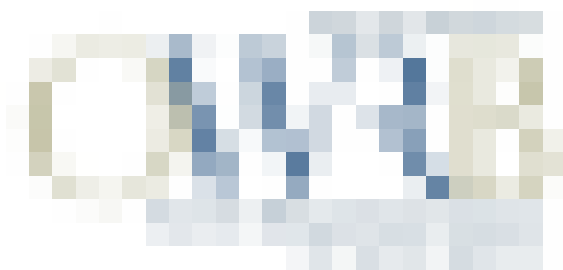
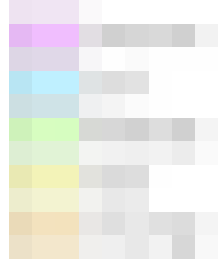
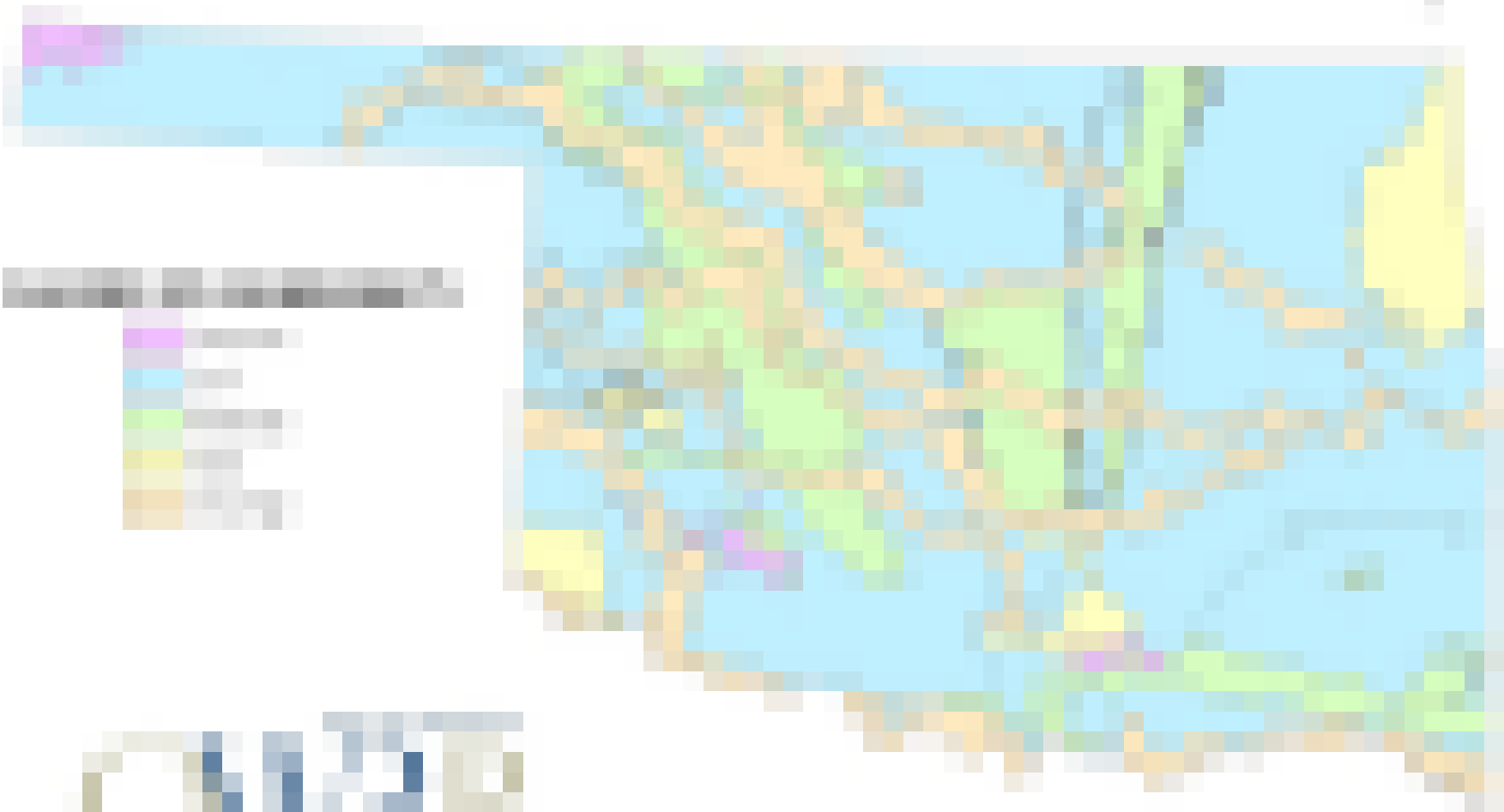
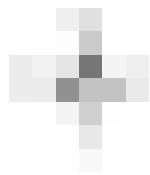


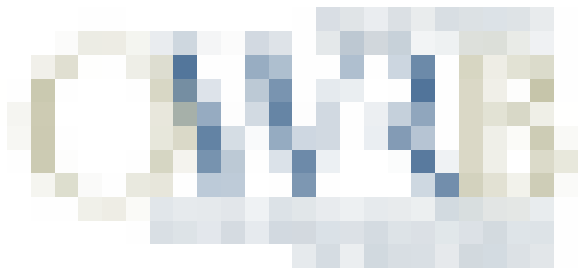
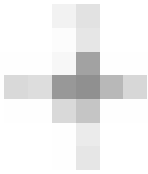
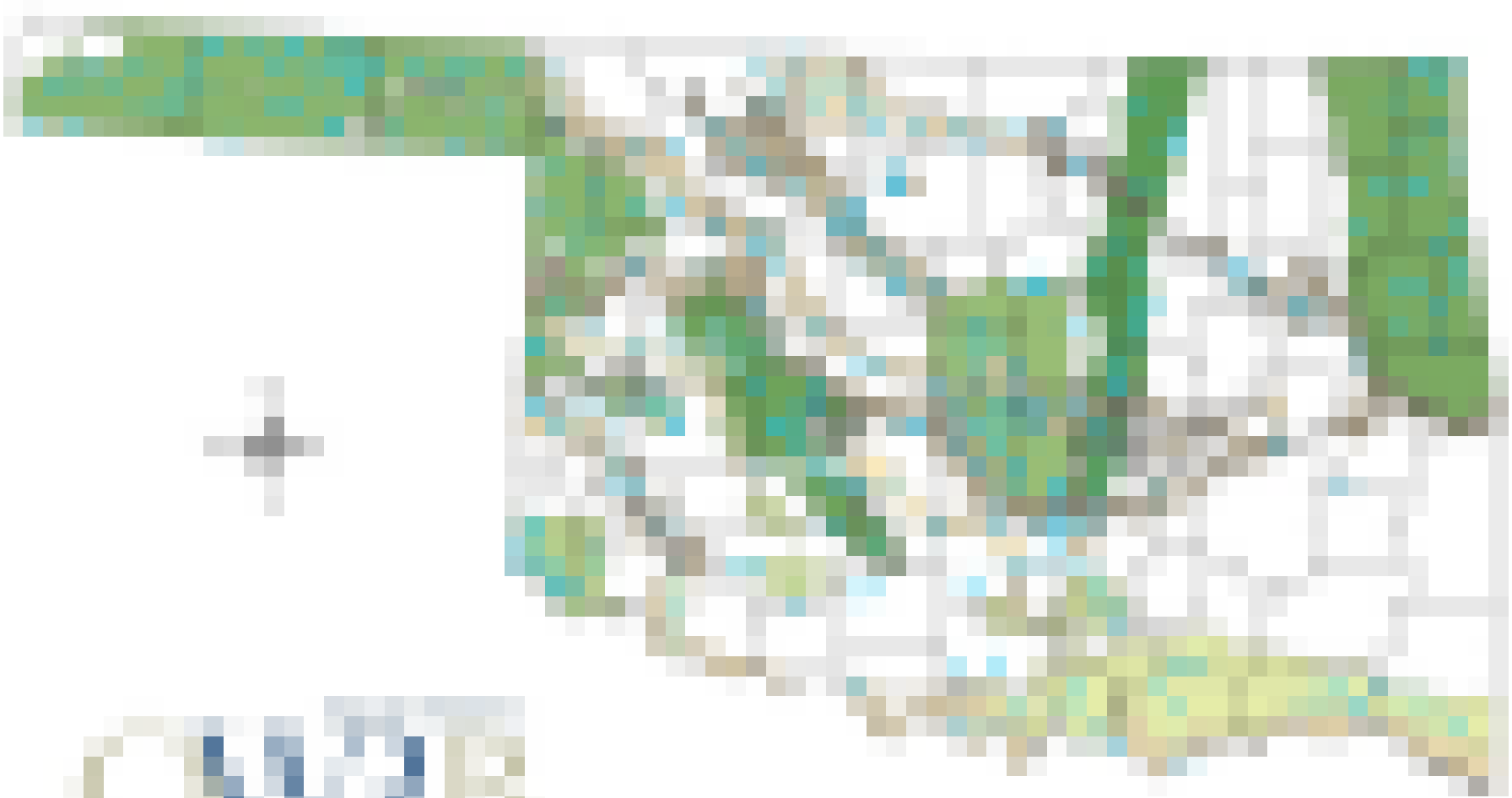
Groundwater Monitoring\ Assessments\Data

- ✓ Hydrologic Surveys- Groundwater Budget Assessments
- ✓ Annual Water Level Measurements
- ✓ Vulnerability Assessments (Published in OWQS)
- ✓ Public Water Supply Systems
- ✓ USGS National Water Quality Assessment Program (NAWQA)
- ✓ GWQD from OWRB Aquifer & Pilot Studies
- ✓ GWQD from OWRB Historical Ambient GW Network

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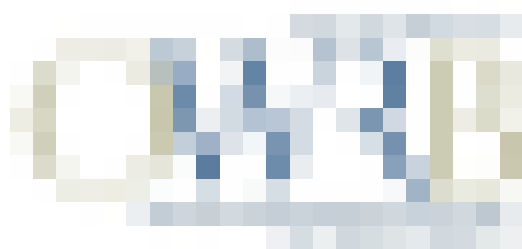
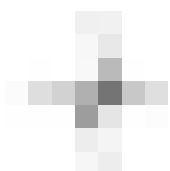
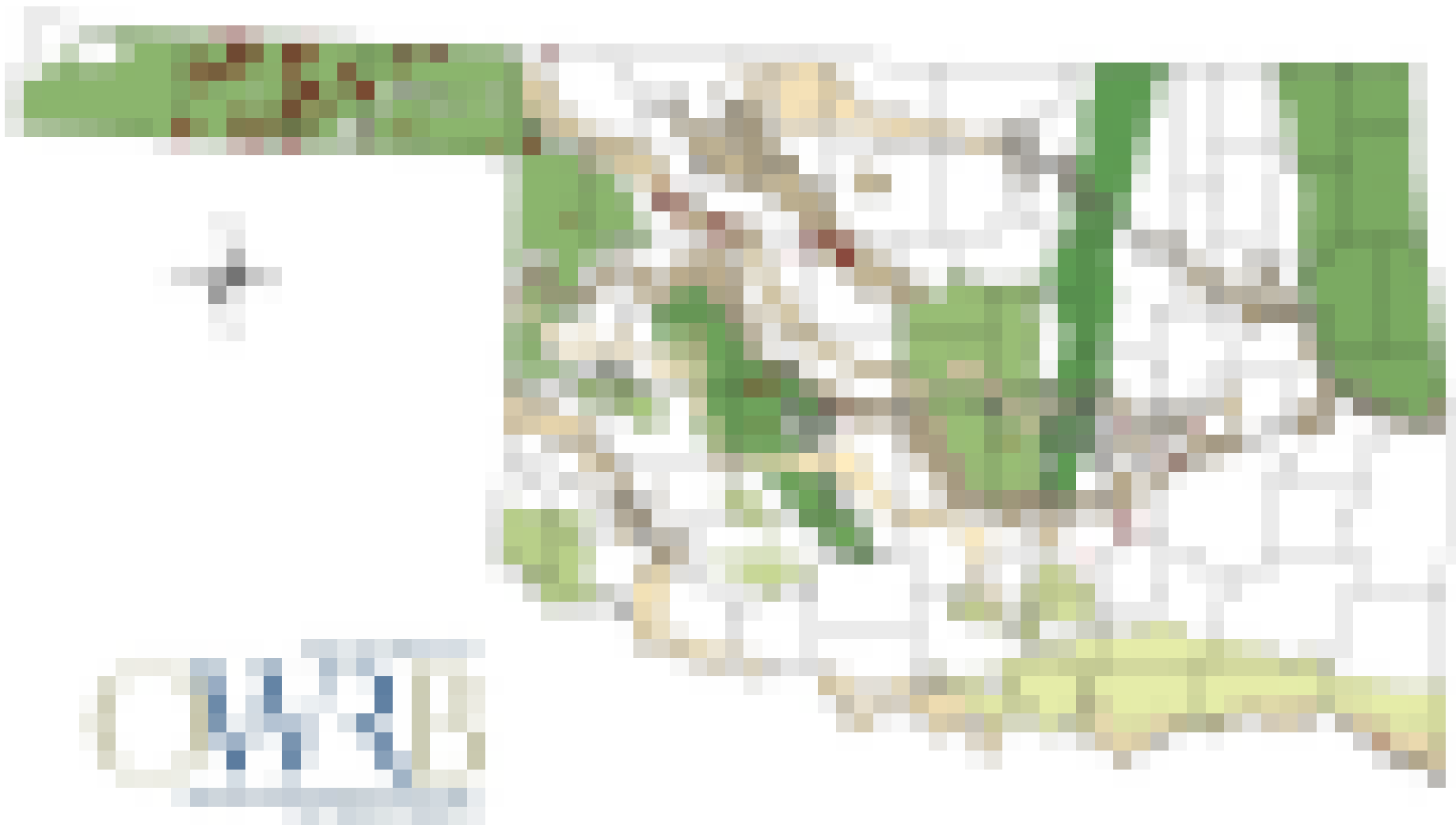






Current Groundwater Quality Monitoring

- ✓ Frequent system checks on Public Water Suppliers (reports to DEQ)
- ✓ Special Groundwater Studies (Arbuckle-Simpson Aquifer)
- ✓ Nutrient monitoring, at swine licensed managed feeding operations.



A Groundwater Monitoring Strategy for Oklahoma

- A monitoring strategy should define the role that groundwater will have in meeting Oklahoma's future water needs. What does Oklahoma need to know in terms of groundwater quality?
- Baseline monitoring for characterization: What are typical groundwater quality characteristics for each basin?
- Determine spatial distribution of aquifer parameters.
- Map or describe groundwater quality concern areas.
- Long-term monitoring (trends).
- Beneficial use support (or lack thereof).
- Evaluate relationships between land use and quality.

Cost of Doing Business as Usual

- ✓ Resource Managers cannot make informed decisions about risk, aquifer use and protection.
- ✓ Can't develop a protection/utilization strategy based on data.
- ✓ Land use zoning and planning decisions; based on what - emotion?
- ✓ Uncertain about public health risks.
- ✓ Can't plan for future water supplies; can't certify resource, beneficial use support?
- ✓ Won't know if a relationship exists between land use and groundwater quality.
- ✓ Possible risks to private wells owners unknown.

Summary

- ✓ What you don't know **CAN** hurt you.
- ✓ Without a coherent State/Federal GW Strategy, we're all just chasing rabbits.
- ✓ At its best, monitoring is not sexy, and GW monitoring is having trouble even getting discussed.
- ✓ Groundwater is under utilized and appreciated.

State of Oklahoma

OWR&B

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