



Arkansas Water Plan Surface Water Quality

Water Availability Meeting
October 22, 2013



Criteria

- **State-wide assessment**
- **Regional and state-wide information sources**
- **Water quality assessed at water quantity assessment sites**
- **Extant data over a 30-year period of record**
- **Current status, comparison to 1990, trends over this 30-year period, and emerging issues**

Information Sources

- **State-wide information sources**
 - ADEQ
 - USGS
- **Updated information since 1990 Plan**
- **Selected sources within water resources planning regions**
 - **Beaver Water District**
 - **Ft. Smith**
 - **Central Arkansas Water**
 - **ANRC**
 - **AR Department of Health**

Analyses

- **Used existing results for current status**
 - 305(b) reports
 - 303(d) lists
- **Demand water use sectors**
- **Summary by AR WR Planning Regions**
- **WQ Trend analyses at concurrent water supply sites**
- **Flow-adjusted Seasonal Kendall trend analyses**
- **Issues: since 1990 Plan and emerging**

Results

Current (2008) Water Quality: Impaired Stream Miles, Lake Acreage

Designated use	Water Demand Sector Use	Impaired Stream Miles	Impaired Lake Acres
Fish Consumption	Recreation	363.3	23,637
Aquatic Life	Fish & Wildlife	2,439.9	11,248
Primary Contact	Recreation	564.8	0
Secondary Contact	Recreation	7	0
Domestic Water Supply	Drinking Water	448.3	97,105
Agri & Ind Water Supply	Agric, Industry	967.7	0
Total miles (acres) impaired		4,086.5	127,520
Total miles (acres) assessed		9,849.7	357,896

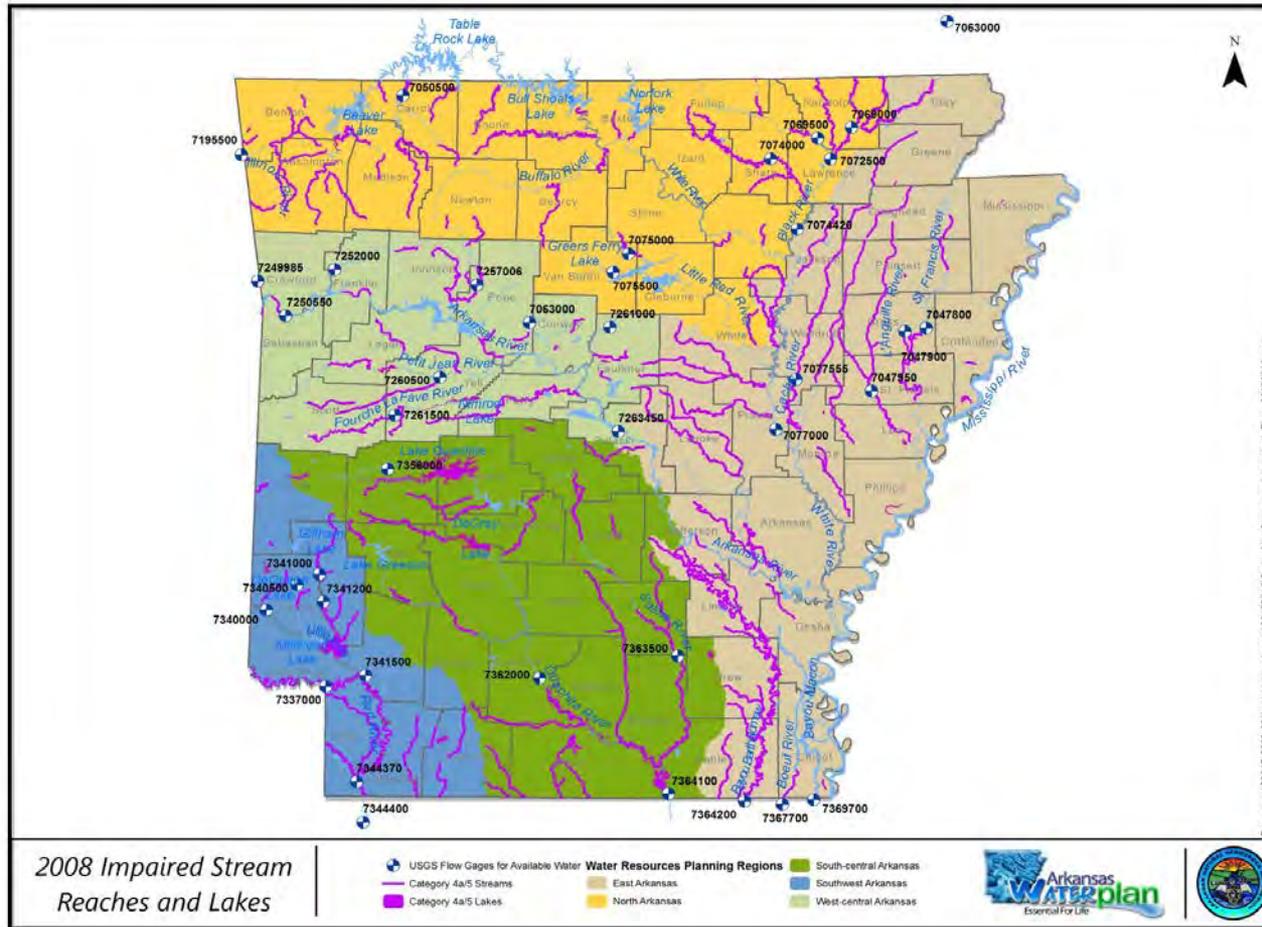
2008 Stream Water Quality: Causes of Impairment

Causes	Stream Miles
Siltation/Turbidity	1,156.3
Organic Enrichment/ Low DO	1,308
Mercury	319
Priority Organics	44.8
E. coli	638.8
Chlorides	691.7
Sulfates	511
Total Dissolved Solids	1,021.7

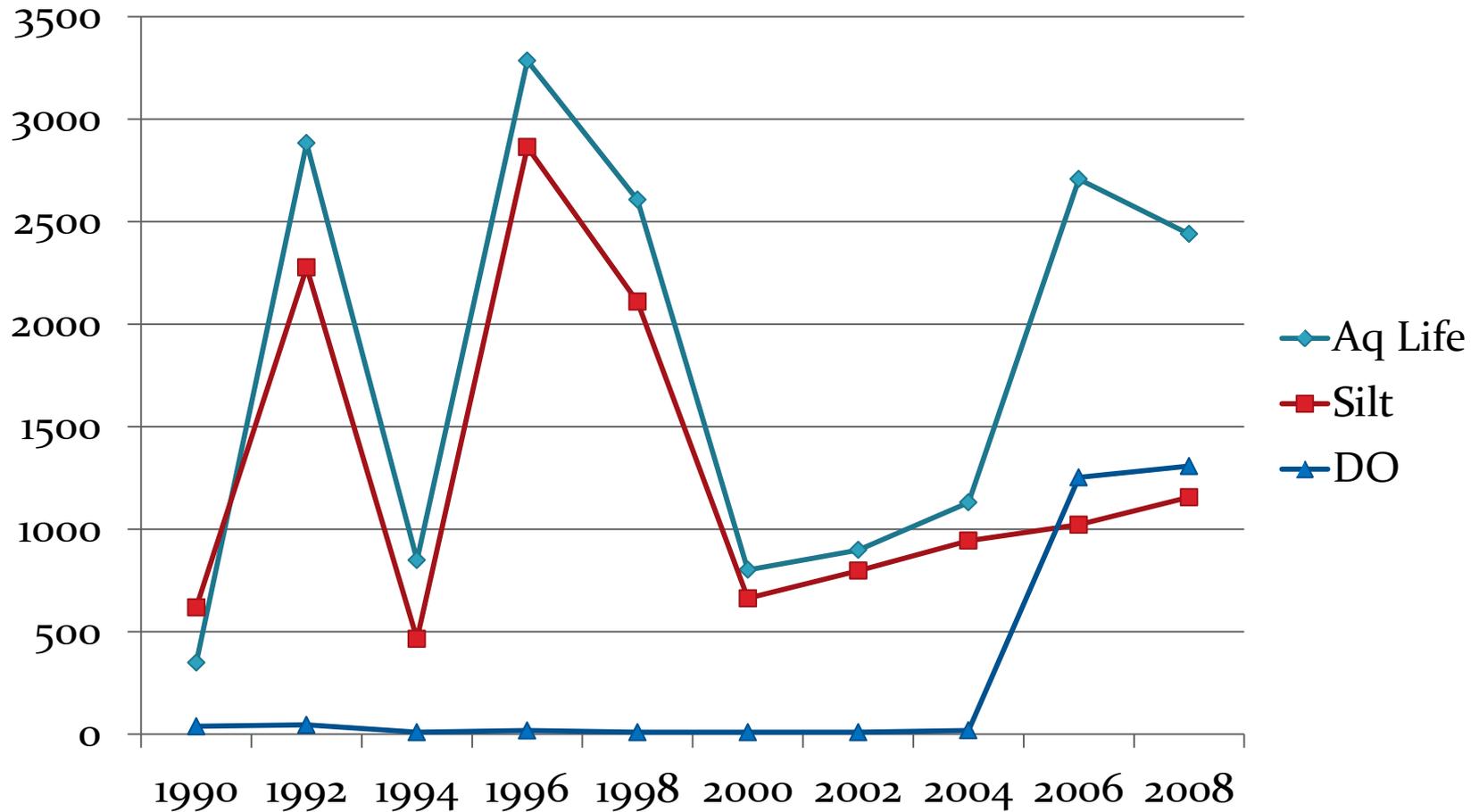
2008 Lake Water Quality: Causes of Impaired Lake Acreage

Causes	Lake Acreage
Siltation/Turbidity	3,235
Nutrients	4,625
Mercury	18,677
Priority Organics	<10
Beryllium	97,105
Copper	335
Unknown	30,485

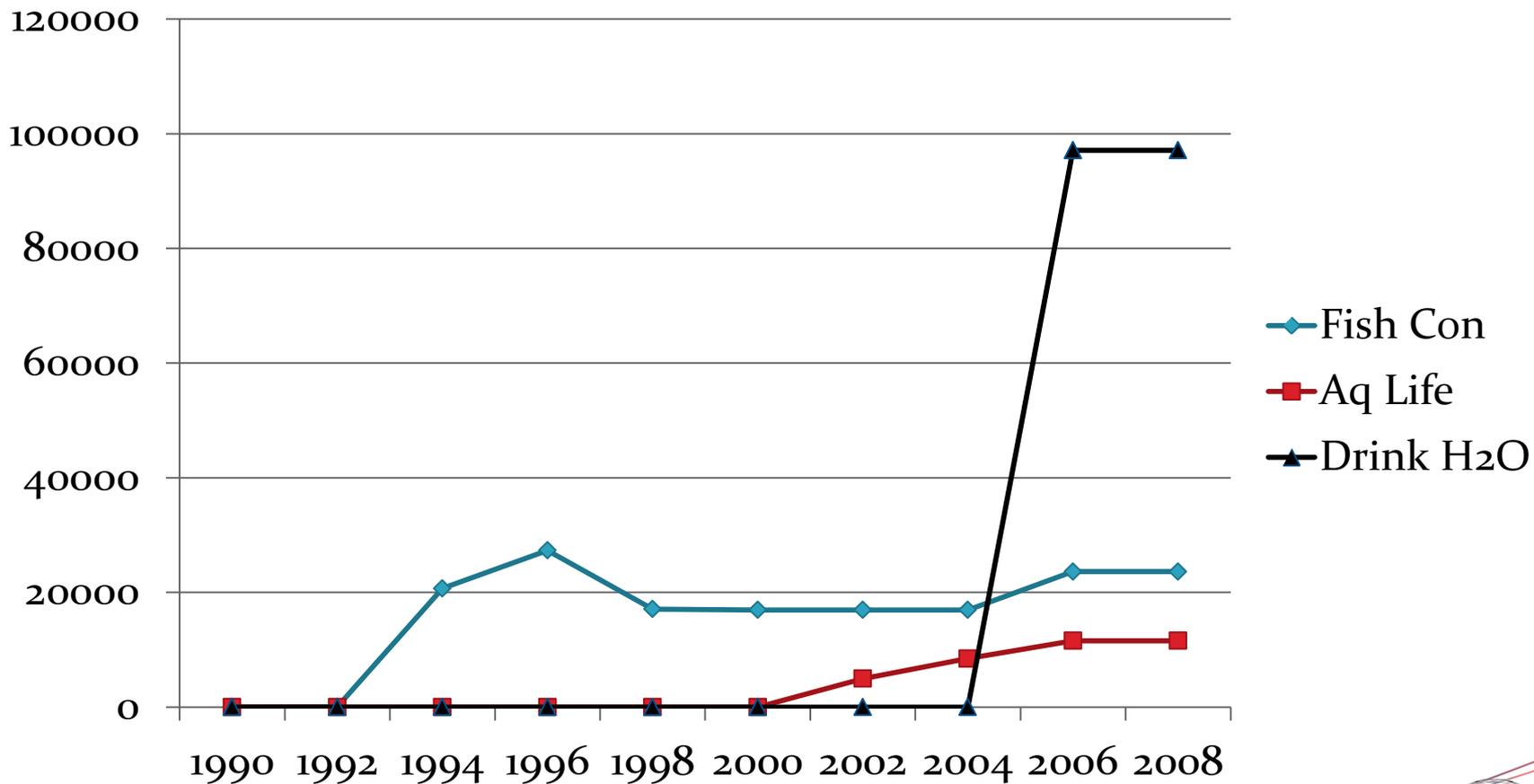
Current Water Quality



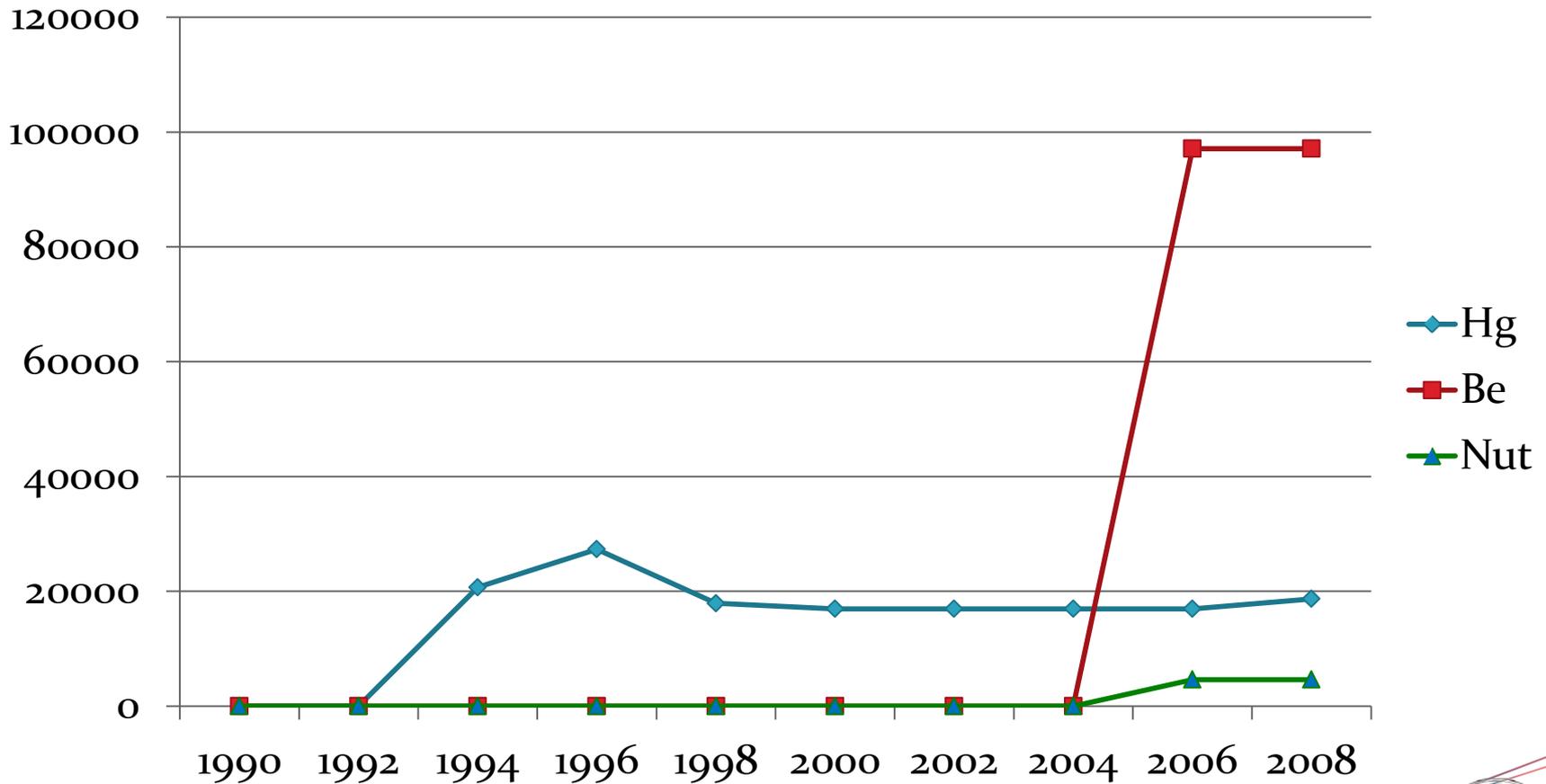
Impaired Stream Miles – Aquatic Life Use & Causes



Impaired Lake Acres – Designated Uses



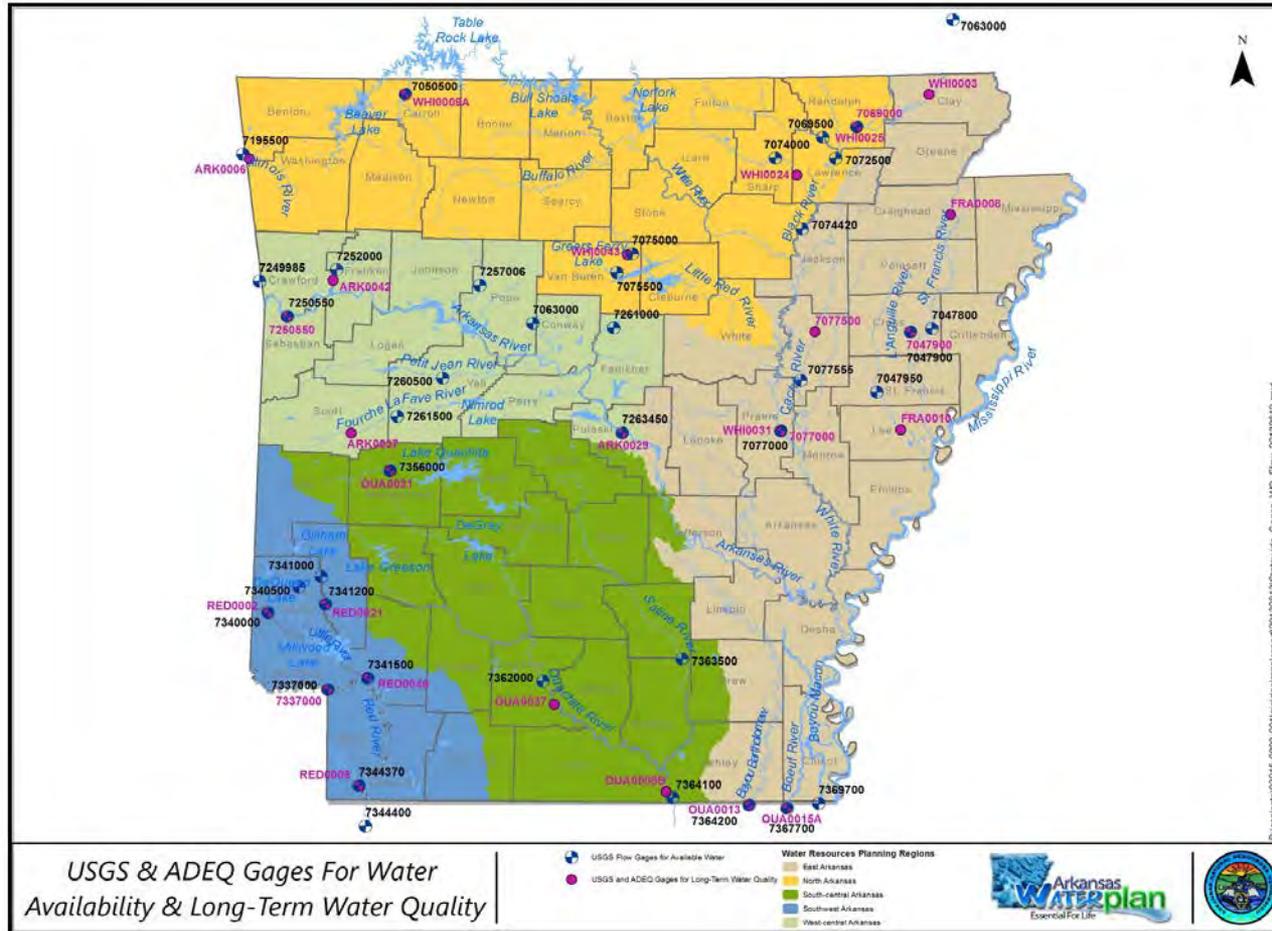
Impaired Lake Acres - Causes



Summary

- **Most assessed streams/lakes attained uses**
- **Have been changes in attained uses since 1990 due to:**
 - ❖ **Different stream populations and causal factors over time**
 - ❖ **Methodological differences over time**
 - ❖ **Different reasons for listing over time**
- **No clear trends in impaired uses or causes**

Water Quality Change/Trend Stations



R:\projects\0016-0001-001\gagedata\report\20130613\Arkansas_Gages_WQ_Flow_20130613.mxd

Parameters Analyzed*

- DO
- Inorganic N
- TKN
- Total P
- Turbidity
- TSS
- Fecal Coliforms

*Parameters analyzed primarily related to aquatic life use

Fecal coliforms related to recreational use

Results of Q-adjusted Seasonal Kendall East Planning Region

Stream Name	Water Quality Trends					
	DO	Inorganic N	TKN	Total Phosphorus	Turbidity	TSS
St. Francis Bay	↓	< 30 yrs	< 30 yrs	< 30 yrs	< 30 yrs	None*
L'Anguille River	↓	None	< 30 yrs	None	↑	↓
Black River	↓	↓	< 30 yrs	None	None	↓
White River	None	↓	< 30 yrs	None	↓	None
Bayou Bartholomew	None	↑	None	↑	<30 yrs	↓

* TSS not available, suspended sediment concentration analyzed

Results of Q-adjusted Seasonal Kendall South-central Planning Region

Stream Name	Water Quality Trends					
	DO	Inorganic N	TKN	Total Phosphorus	Turbidity	TSS
Ouachita River - Mt. Ida	↓	None	None	None	↑	↓
Ouachita River - Camden	None	↓	↓	↓	None	↓

Results of Q-adjusted Seasonal Kendall Southwest Planning Region

Stream Name	Water Quality Trends					
	DO	Inorganic N	TKN	Total Phosphorus	Turbidity	TSS
Red River - Index	↓	< 30 yrs	↑	↑	< 30 yrs	None*
Little River	↓	None	<30 yrs	None	None	↓
Saline River	↑	↑	< 30 yrs	↑	↓	↓
Red River - Spring Bank	None	None	None	↓	↓	↓

* TSS not available, suspended sediment concentration analyzed

Results of Q-adjusted Seasonal Kendall West-central Planning Region

Stream Name	Water Quality Trends					
	DO	Inorganic N	TKN	Total Phosphorus	Turbidity	TSS
Arkansas River - Van Buren	None	< 30 yrs	↓	None	< 30 yrs	↑ *
Mulberry River	↑	None	< 30 yrs	↓	↓	↓
Fourche La Fave River	↓	None	< 30 yrs	↓	<30 yrs	↓
Arkansas River - Little Rock	None	↓	↓	↑	None	↓

* TSS not available, suspended sediment concentration analyzed

Results of Q-adjusted Seasonal Kendall North Planning Region

Stream Name	Water Quality Trends					
	DO	Inorganic N	TKN	Total Phosphorus	Turbidity	TSS
Kings River	↑	None	None	None	None	↓
Black River	↓	↓	< 30 yrs	None	None	↓
Strawberry River	None	None	< 30 yrs	↑	↑	None
Middle Fork Little Red R.	↓	↓	< 30 yrs	↓	None	↓
Illinois River	<30 yrs	<30 yrs	< 30 yrs	↓	↓	↓

Emerging Water Quality Issues

- **Contaminants of emerging concern**
 - Endocrine disrupters
 - Plasticizers, fire retardants
 - Pharmaceuticals, etc.

Next Steps

- **Incorporate comments and finalize the report**
- **Consider results in the Gap analyses**
- **Formulate recommendations based on the Gap analyses.**

Overall Water Quality Summary

- **Most assessed streams/lakes attained uses**
- **No statewide patterns of use impairment or causes, except fish consumption (mercury) since 1990**
- **Declining trends in suspended solids across most water resources planning regions**
- **Potential emerging concern – trace organics known as CECs**

Questions?