Oklahoma Comprehensive Water Plan
Basic Water Science Seminar

May 14 2009

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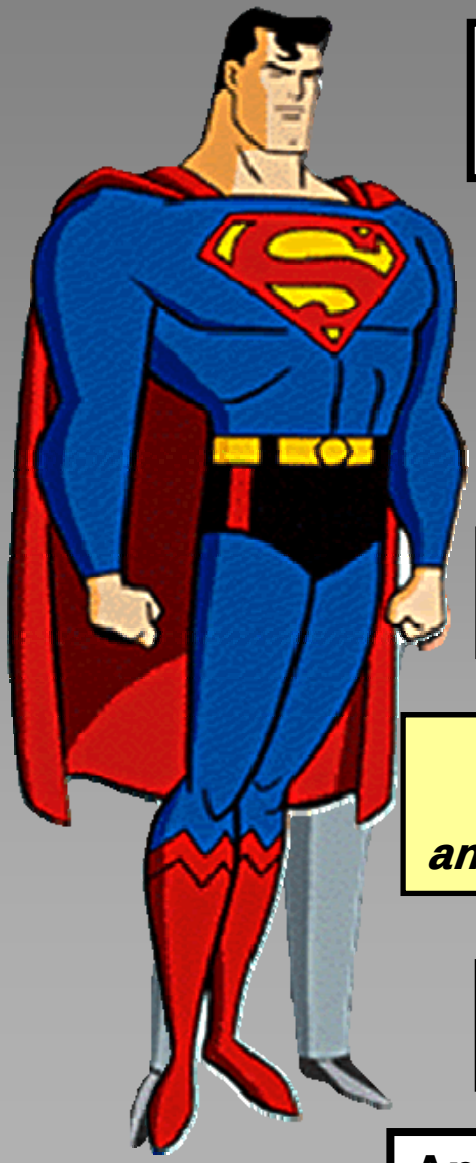
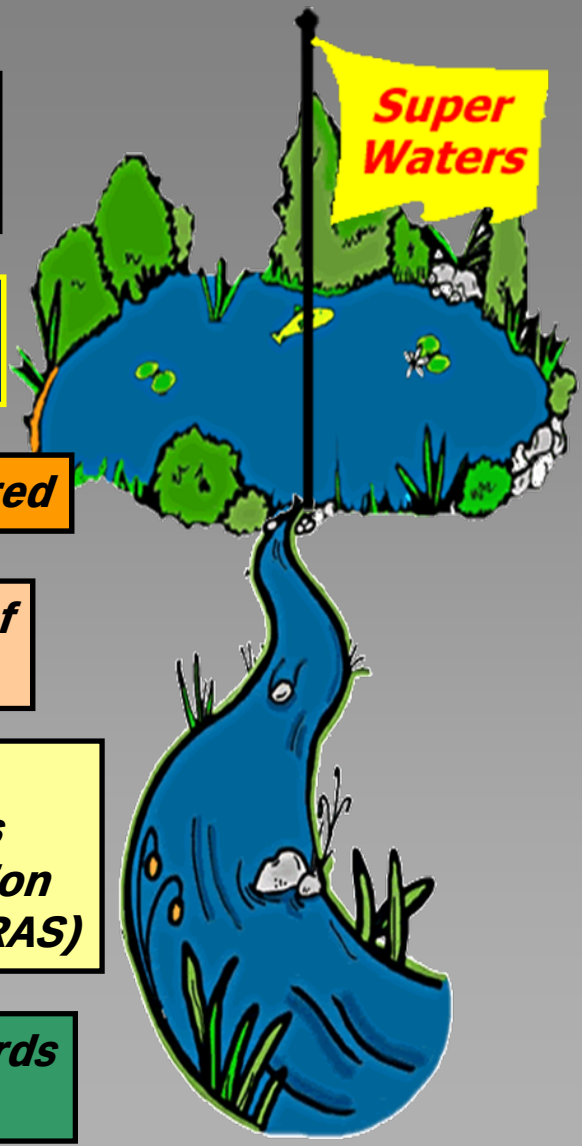
Water Quality Division
Oklahoma Water Resources Board

Human Health Planning & Water Quality Management

A Correlation



Annual Physical	Monitoring BUMP/305(b)
Healthy	Meets Water Quality Standards
Sick	Water Quality Impaired
See a Specialist	Add to 303(d) List of Impaired Waters
Get Well (Antibiotics and/or Surgery)	Complete TMDL's & Intensive Studies (Watershed Restoration Action Strategies -- WRAS)
A Healthy Routine	Water Quality Standards Implementation
Annual Physical	Monitoring

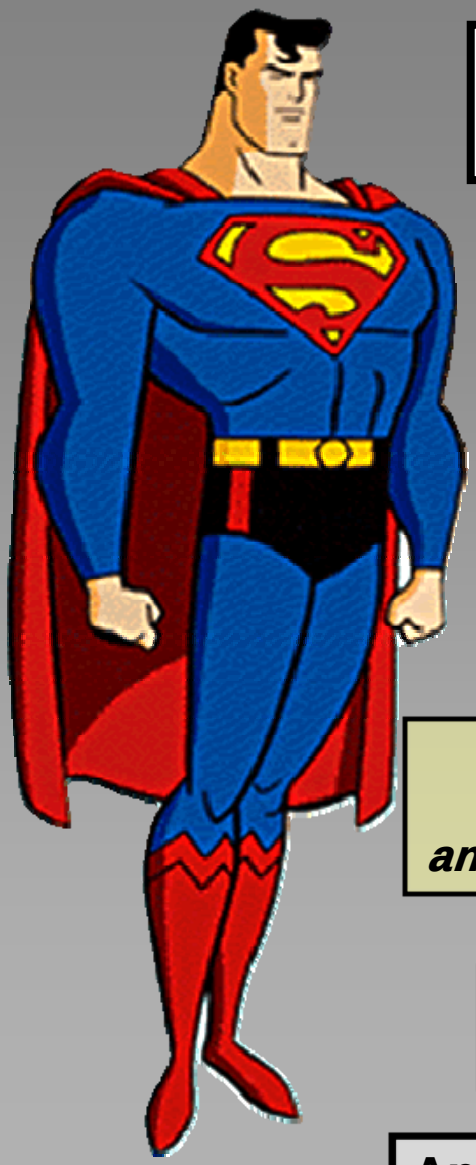


Human

Waters of the State

Human Health Planning & Water Quality Management

A Correlation



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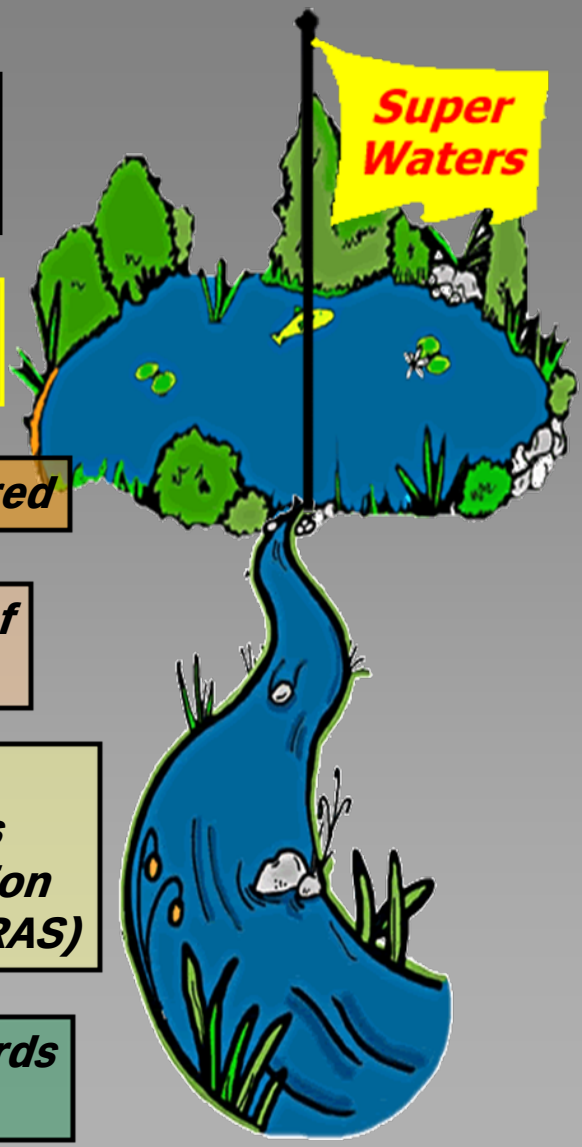


Human

Waters of the State

Annual Physical - Monitoring
Beneficial Use Monitoring Program (BUMP)

- The 305(b) Report is a report to Congress on "The state of the state's waters".
- Published every two years by the ODEQ and available on the ODEQ website at www.deq.state.ok.us.
- Provides programmatic information on whether the beneficial uses assigned to surface waters are being supported, threatened or impaired.
- Identifies the trophic status of Oklahoma's significant publicly owned lakes.
- Also reviews the quality and status of waters receiving additional protection consistent with the Anti-degradation policy.
- If a water is NOT meeting its beneficial uses; it is listed on the state's 303(d) list.

Annual Physical - Monitoring
Beneficial Use Monitoring Program (BUMP)

Overview -- (BUMP)

- Created in 1998.
- Statewide water quality monitoring program directed by the OWRB.
- Provides objective evaluation of Oklahoma waters concerning their ability to support individual beneficial uses prescribed by Oklahoma's Water Quality Standards:
  - determine the effectiveness of point and non-point source controls in maintaining beneficial uses;
  - identify waters supporting (or not supporting) beneficial uses, locate threatened waters and determine water quality trends.

Annual Physical - Monitoring
Beneficial Use Monitoring Program (BUMP)

The 5 Monitoring Components of BUMP:

- Fixed Station Stream Monitoring
- Rotating Station Stream Monitoring
- Fixed Station Lakes Monitoring
- Fixed Station Load Monitoring (in development)
- Fixed Station Groundwater Monitoring (in development)

Healthy - Meets Standards

Oklahoma Water Quality Standards

CWA

SEC. 101. (a) ...to restore and maintain the chemical, physical, and biological integrity of the Nation's Waters

Oklahoma Statutes

Title 82. Waters and Water Rights

Section 1084.1 .....to protect, maintain and improve the quality thereof for public water supplies, for the propagation of wildlife, fish and aquatic life and for domestic, agricultural, industrial, recreational and other legitimate beneficial uses

Healthy - Meets Standards
Oklahoma Water Quality Standards

- Criteria (both narrative and numerical) are promulgated to protect each beneficial use.
- The Antidegradation Policy is designed to protect those waters where we want water quality better than that necessary to support beneficial uses. Includes Sensitive Water Supply protection, High Quality Waters, Appendix B areas and Outstanding Resource Waters. More stringent pollution controls are put in place in these waters.
- WQS MUST balance environmental protection, sound science and rational public policy and be promulgated in a transparent public process.
- Remember - WQS are the water quality management targets for all water quality management activities.

Water Quality Standards (WQS) and Implementation

- **WQS are the cornerstone of WQ Management**
  - WQS establish water quality benchmarks for the state's waterbodies, which lead to the development of permitting regulations and pollution control programs

- **WQS – 3 components**
  - Beneficial Uses
  - Criteria to protect the beneficial uses
  - Anti-degredation Policy

- **AND**

  <u>Implementation</u>

Water Quality Standards and Implementation

- **Revision Process**
  - Required every 3 years by CWA
  - Public Participation (notice, comment period, and hearing)
  - Board Adoption
  - Legislative Approval
  - Governor Approval
  - Oklahoma Attorney General Certification
  - EPA Review and Adoption

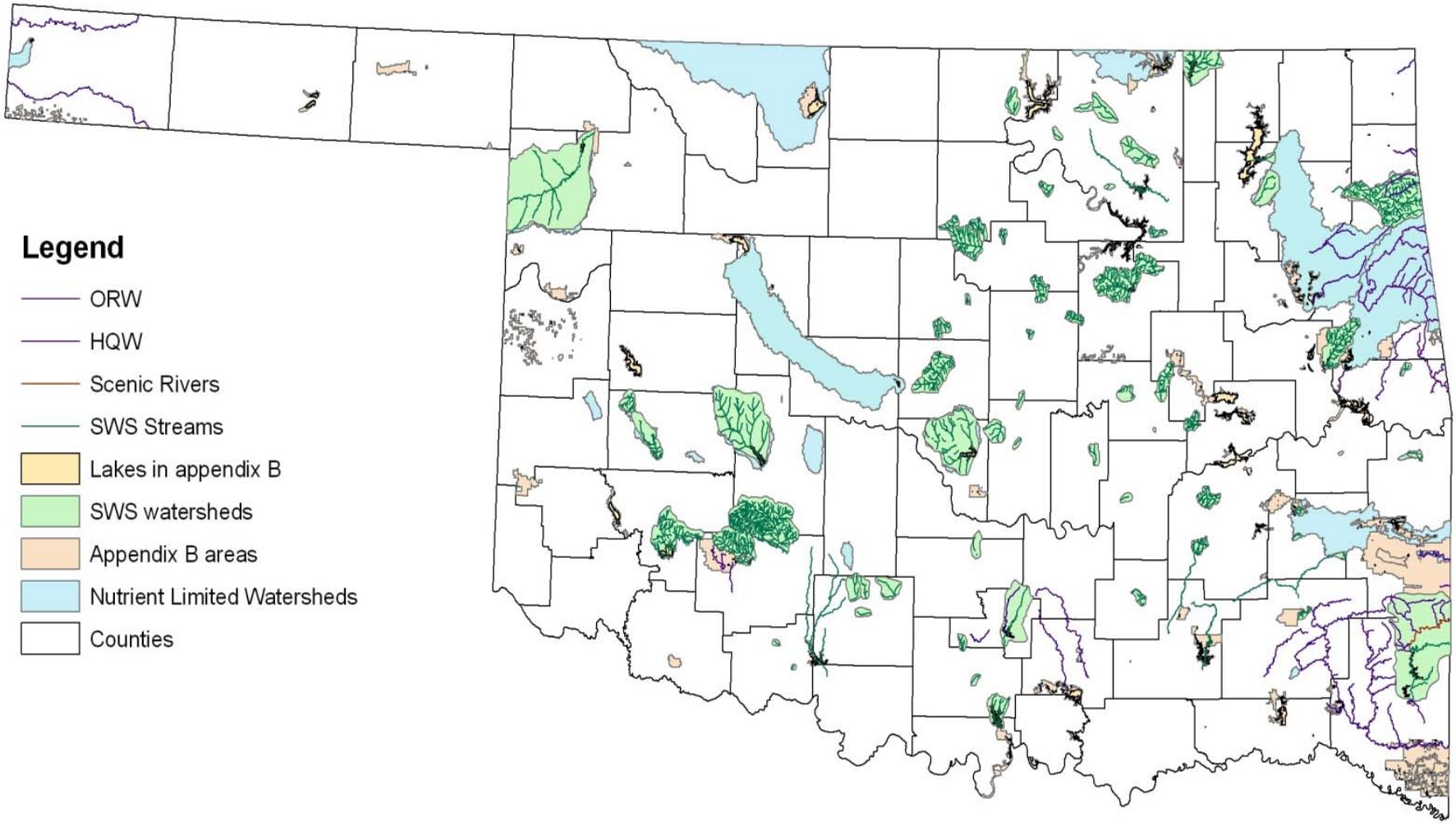
Water Quality Standards and Implementation

- WQS change in response to updated science and the needs of Oklahoma citizens

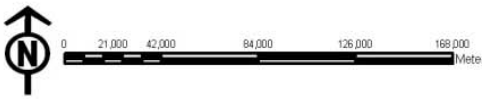
Anti-degradation Policies

- **Three Tiers**
  - Tier I: maintain the beneficial uses
    - Protect uses with criteria
  - Tier II: protection for our “best” waterbodies
    - Protect HQW with discharge/spatial limitations
  - Tier III: highest level of protection
    - Protect with “No new discharges”
- **Designed to keep water quality from declining** (Tier II & III)
    - ORW
    - Scenic Rivers
    - Appendix B waters
    - HQW
    - Sensitive Public and Private Water Supplies
    - Culturally Significant Waters

Waterbodies with Additional Protection



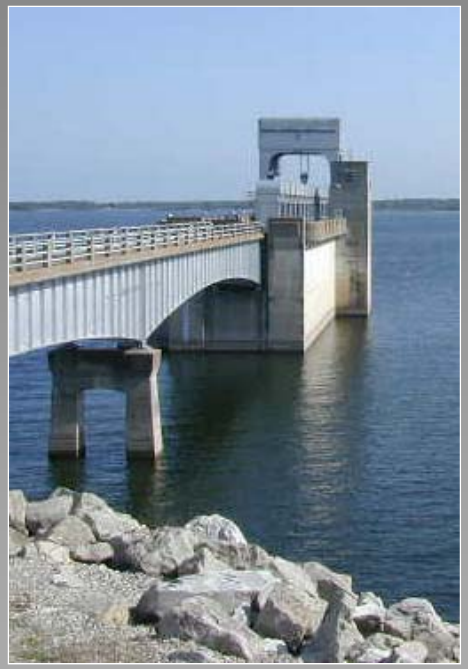
This map is provided as a convenience to illustrate waters and areas described in Oklahoma Water Quality Standards. The authoritative designations are codified in the OWRB's rules maintained by the Oklahoma Secretary of State in Oklahoma Administrative Code Title 785, Chapter 45 and it's associated appendices.



Beneficial Uses

And Criteria to Protect Them

- **Water Supply**
  - Bacteria
  - Metals
- **Fish and Wildlife Propagation**
  - Dissolved Oxygen
- **Agriculture**
  - TDS
- **Recreation**
  - Bacteria
  - Nutrients
- **Navigation**
- **Fish Consumption**
  - Mercury



APPENDIX A. DESIGNATED BENEFICIAL USES FOR SURFACE WATERS

Waterbody Name and Sequence	Waterbody ID Numbers	Water Supply	F&W Prop	Ag	Rec	Aes	Limit-ations	Remarks
Fort Gibson Reservoir	121600010050, 121600010200	PPWS	WWAC	●	PBCR	●		NLW
Ranger Creek	121600010060	PPWS	WWAC	●	PBCR	●		
Fourteen Mile Creek	121600010100	PPWS	CWAC	●	PBCR	●	HQW	

Appendix G. Numerical Criteria

PARAMETER	CAS #	Fish & Wildlife Propagation		Public and Private Water Supply (Raw	Fish Consumption and Water	Fish Consumption
		ACUTE	CHRONIC			
		µg/L	µg/L	mg/L	µg/L	µg/L
PCE (Tetrachloroethylene)	127184	5280			8	88.5
Pentachlorophenol	87865	e[1.005(pH)-4.830	e[1.005(pH)-5.290]		1014	29370
Perchlorate	14797-73-0	6600	1800		9	
Phthalate esters				0.003		
RDX	121824	2591.5				
Toluene	108883		875		10150	301900

Non-carcinogenic Human Health Criteria Derivation

$$AWQC = 0.002x0.20x\left[\frac{45}{2+\sum_{i=2}^{4}(0.0175x1)}\right]$$

RfD (mg/kg/day)	RSC	BW (KG)	DW INTAKE (L)	FISH INTAKE (kg/day)	BAF (mg/kg)
0.002	0.2	45	2	0.0175	1

CRITERION (mg/L)
0.009

Narrative Criteria

(5) **General criteria.**

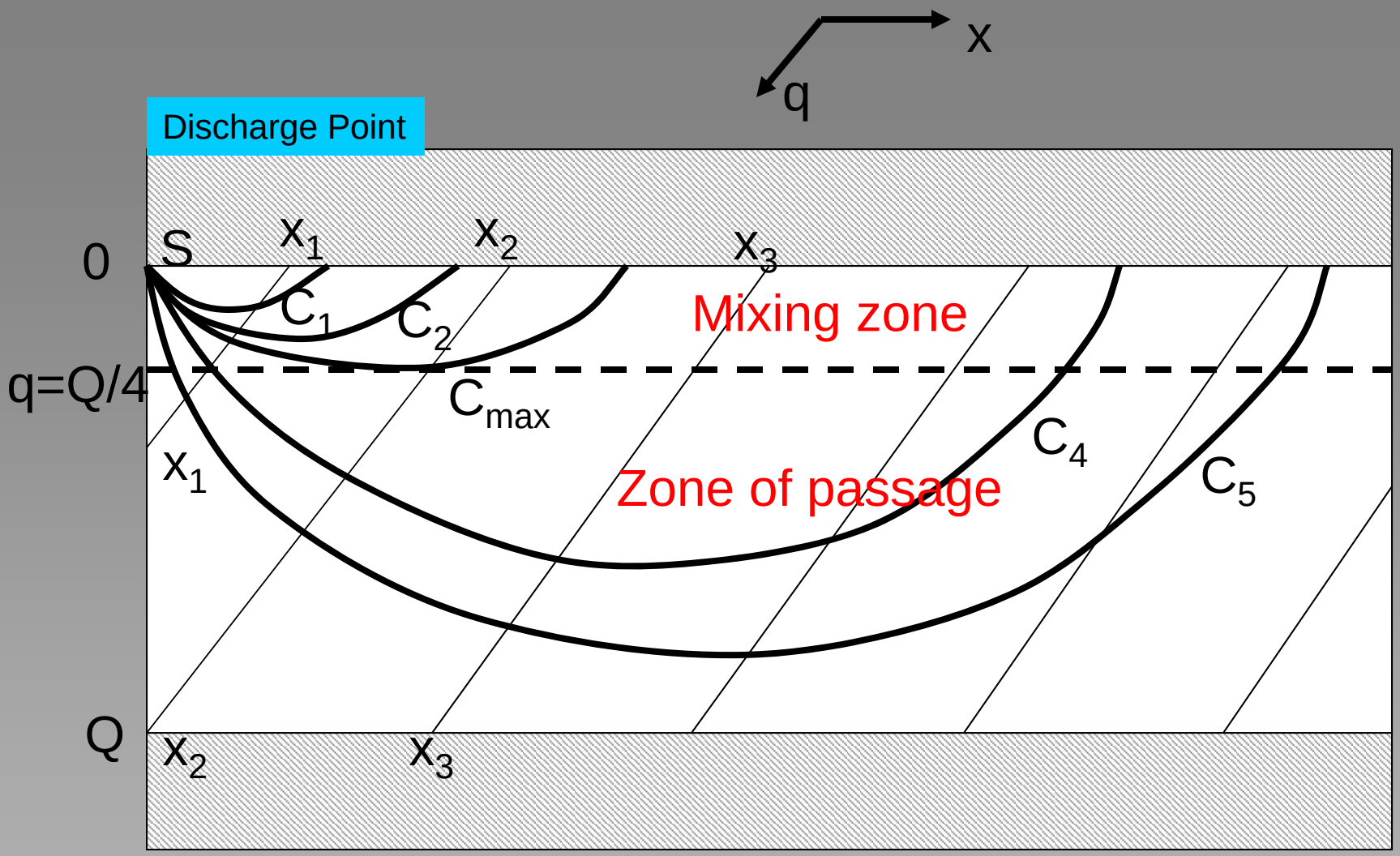
(A) The quality of the surface waters of the state which are designated as public and private water supplies shall be protected, maintained, and improved when feasible, so that the waters can be used as sources of public and private raw water supplies.

(B) These waters shall be maintained so that they will not be toxic, carcinogenic, mutagenic, or teratogenic to humans.

Narrative Criteria

(6) **Toxic substances (for protection of fish and wildlife).**

(A) Surface waters of the state shall not exhibit acute toxicity and shall not exhibit chronic toxicity outside the chronic regulatory mixing zone....



The solution to pollution

Basic Water Science Seminar

- Questions?

- I can be reached at (405) 530-8800 or DRSmithee@owrb.ok.gov

- You may also want to explore the OWRB's web site at:
  - www.owrb.ok.gov