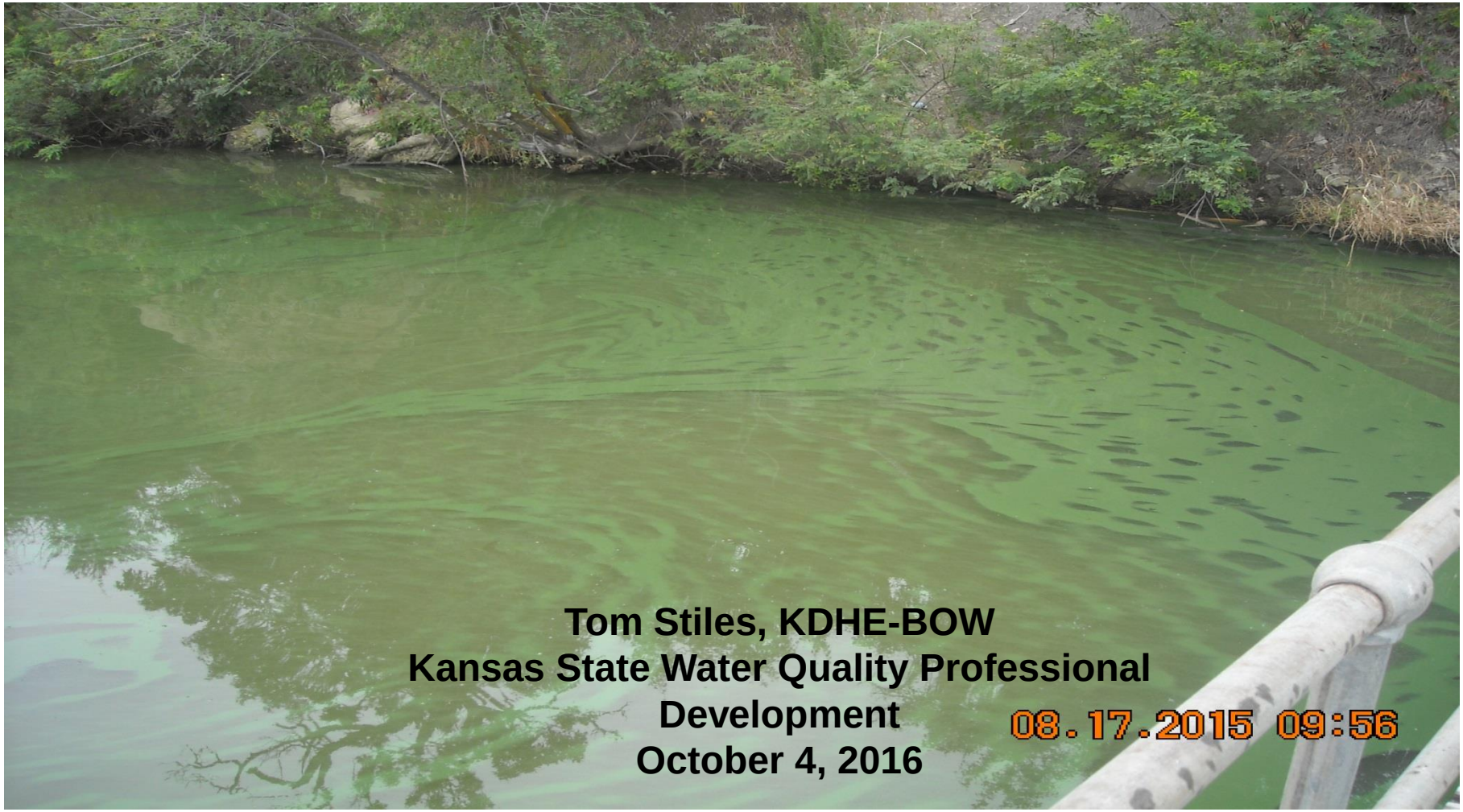
Water Quality in Kansas: The Backstory & the Basics



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Water Quality is Framed by Federal & State Statutes, Regulation & Policy/Program/Practice

- Statute: Clean Water Act (33 U.S.C. 1251, et seq.)
- Regulation: Title 40, Chapter I, Subchapter D
  - Part 122: NPDES Permit Program
  - Part 130: Water Quality Planning & Management
  - Part 131: Water Quality Standards
- Policy: Guidance Memos
- Program: State Statutes and Regulations
  - (EPA permits in Idaho, New Mexico, Mass & NH)
- Practice: Implementation Procedures

Start with the National Goals of the CWA

- **Section 101(a)** - ***The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.***
- ***(1) Eliminate discharge of pollutants into navigable waters by 1985***
- ***(2) Achieve protection and propagation of fish, shellfish, and wildlife and provide for recreation in and on the water by 1983***
- ***(3) No discharge of toxic pollutants in toxic amounts***
- ***(5) Implement areawide waste treatment planning***
- ***(7) Implement programs to control nonpoint sources of pollution***

Kansas Water Quality Standards

- Comprise three components which define water quality
- Designated uses of the water
  - Aquatic Life, Recreation, Domestic Water Supply
  - Food Procurement, Ground Water Recharge
  - Industrial, Irrigation, Stockwater Water Supply
- Criteria
  - Narrative: “free froms”; Nutrients, Sediment
  - Numeric: Atrazine-3 ug/l; Chloride-250 mg/l; E coli-262 CFU/100 ml
- Antidegradation Policy – Protect good water quality

Job 1 for the CWA: Attack Discharges of Pollutants by Point Sources

- ***pollutant means "dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.", and,***

- ***discharge of pollutants means "any addition of any pollutant to navigable waters from any point source.", where,***

- ***point source means "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture."***

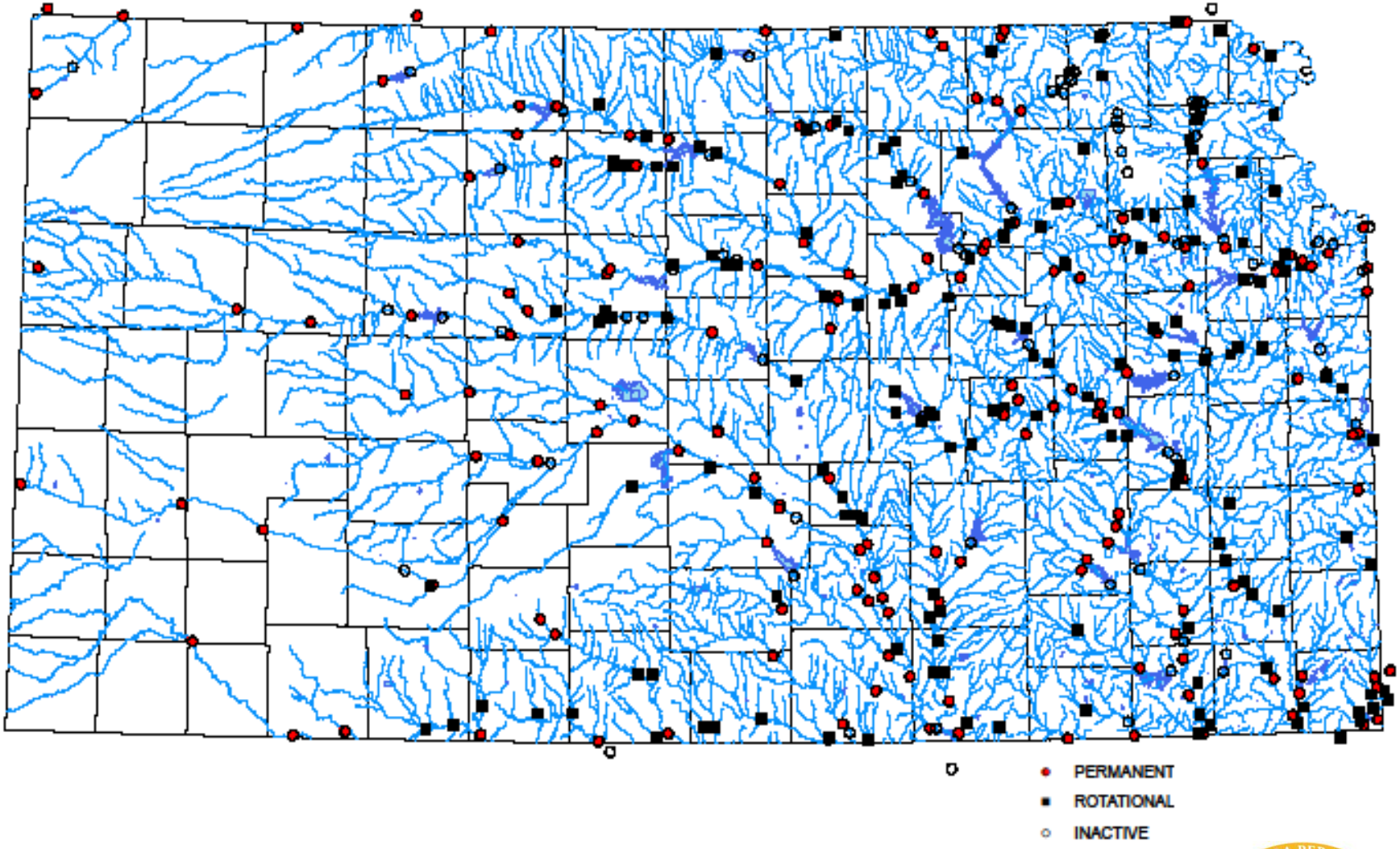
Kansas Permits

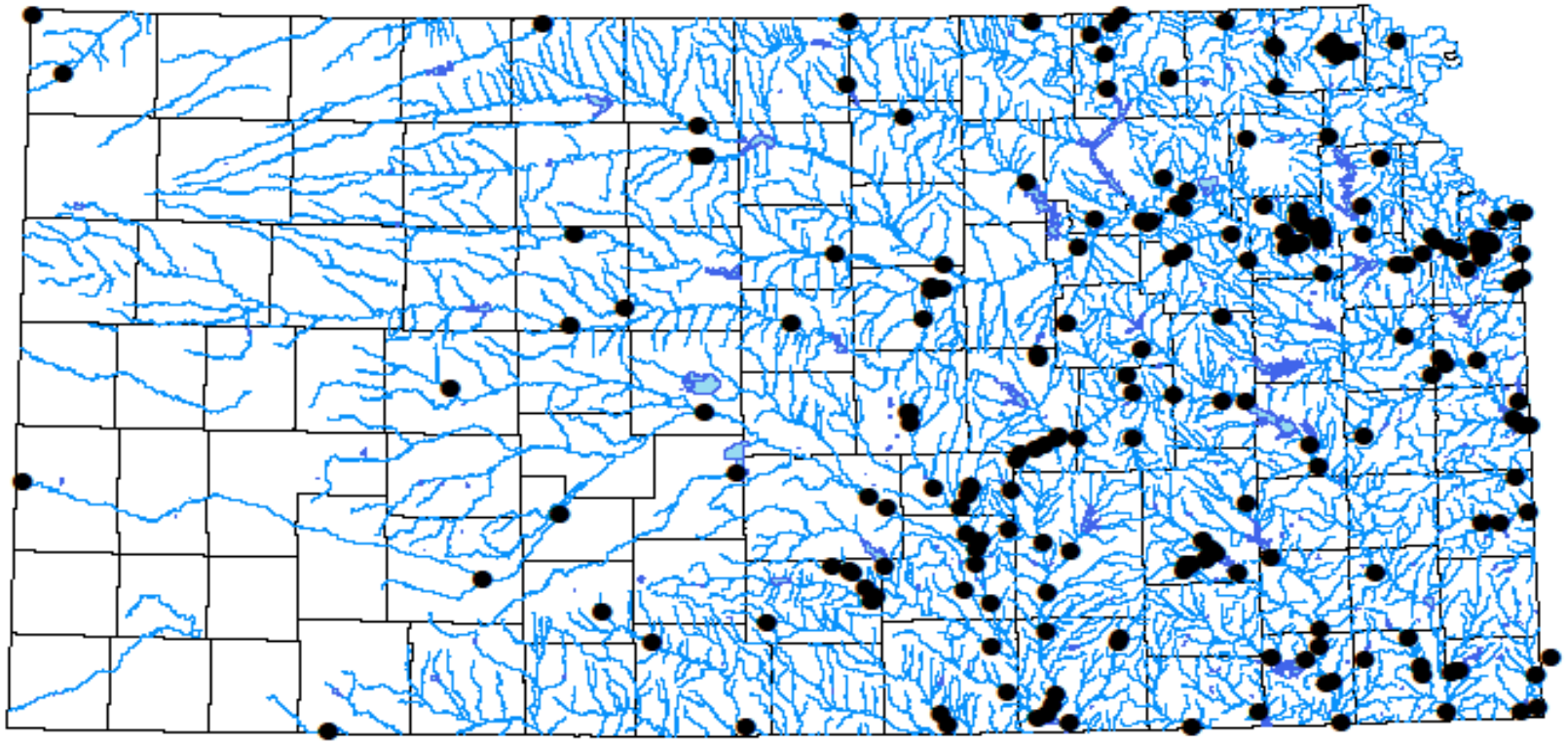
- Individual NPDES Permits
  - Municipal WWTPs – Lagoons & Mechanical Plants
  - Industrial Discharges
  - Confined Animal Feeding Operations over 1000 animal units
- General NPDES Permits
  - Municipal, Industrial & Construction Stormwater
  - Pesticides
  - Quarries
  - Hydrostatic Testing
- State Permits
  - Non-Q Lagoons
  - Small Animal Feeding Operations over 300 animal units

Monitoring Evaluates Water Quality

- Stream Chemistry Monitoring - quarterly
  - Regular/Routine Stations: annually
  - Rotational Stations: every four years
- Stream Biology Monitoring – once per year
- Subwatershed Monitoring – tied to WRAPS
- Stream Probabilistic Monitoring – smaller streams
- Lake and Wetland Monitoring – once every three years
- Harmful Algal Bloom Monitoring – cell counts & toxins
- Fish Tissue Monitoring – basis of fish consumption advisories
- Compliance Monitoring – check on major dischargers

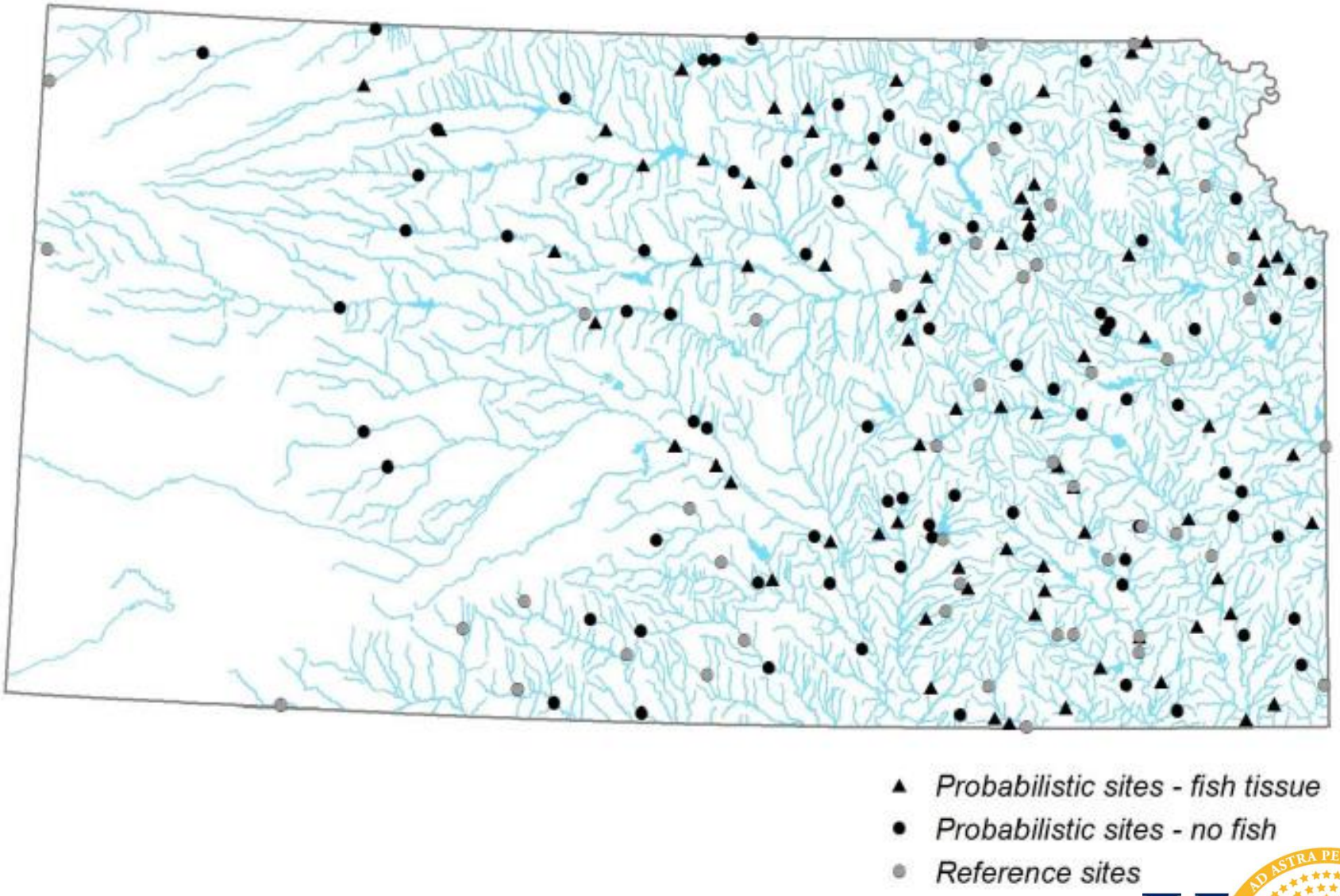
KANSAS STREAM CHEMISTRY MONITORING SITES





Distribution of KDHE stream biological monitoring program stations.

Figure 4. Probabilistic Stream Monitoring Sites, 2010-2014



303d Lists and TMDLs

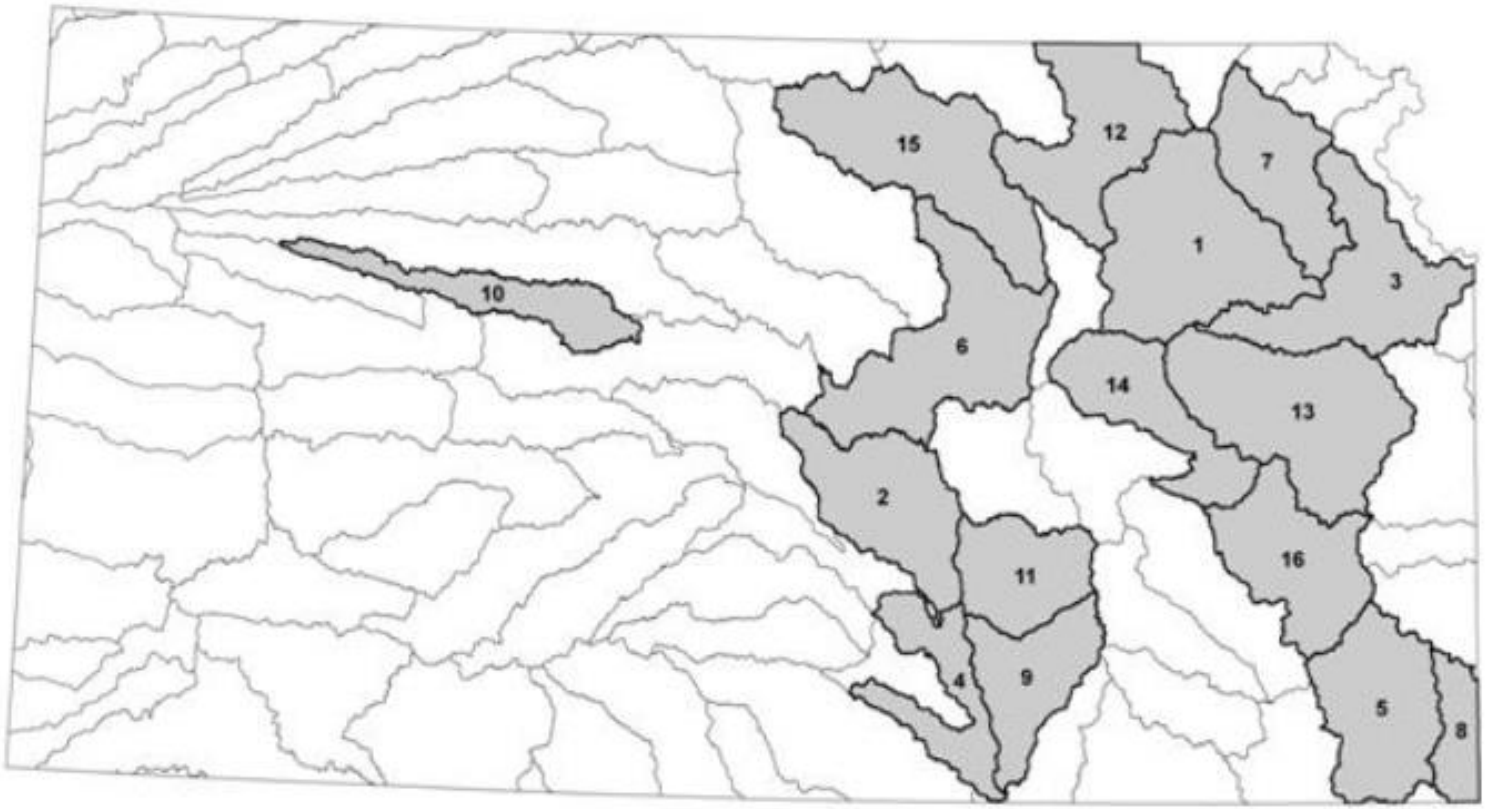
- Section 303d of CWA: State will assess water quality of its streams and lakes relative to its water quality standards and determine which waters are impaired and need a Total Maximum Daily Load to attain WQS.
- TMDL is the permissible amount of pollutant load that a water can receive without causing its water quality standards to not be attained.
- TMDLs comprise Wasteload Allocations for point sources, Load Allocations for non-point sources and a Margin of Safety to hedge for the environment

Inventory of Impaired Waters in Kansas

- 2016 303d list includes 500 impaired watersheds needing TMDLs
- There are 760 existing TMDLs from 1999-2015
- There are 467 waters that have attained WQS
- Pathogens, Sediment & Nutrients comprise a majority of impairments, typically seen as the biology, eutrophication, DO or pH impairments
- But atrazine, lead, copper, selenium, arsenic & sulfate are cited as well
- Kansas has established stream nutrient impairments as its priority to 2022
- Eye toward implementation through NPDES and WRAPS
- Emphasis is on certain HUC 8's in Eastern & Central KS

Priority HUC 8's for TMDLs to 2022

Top Priority HUC 8's with Nutrient Impairments to be Addressed by the 303(d) Program



But Pollution isn't just Pollutants

- ***"pollution means the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."***
- ***Section 101(b): It is the policy of the Congress to recognize, preserve, and protect the primary responsibilities and rights of States to prevent, reduce, and eliminate pollution, to plan the development and use (including restoration, preservation, and enhancement) of land and water resources, and to consult with the Administrator in the exercise of his authority under this Act.***
- **Pollution encompasses changes to habitat and flow, lie outside of realm of CWA.**

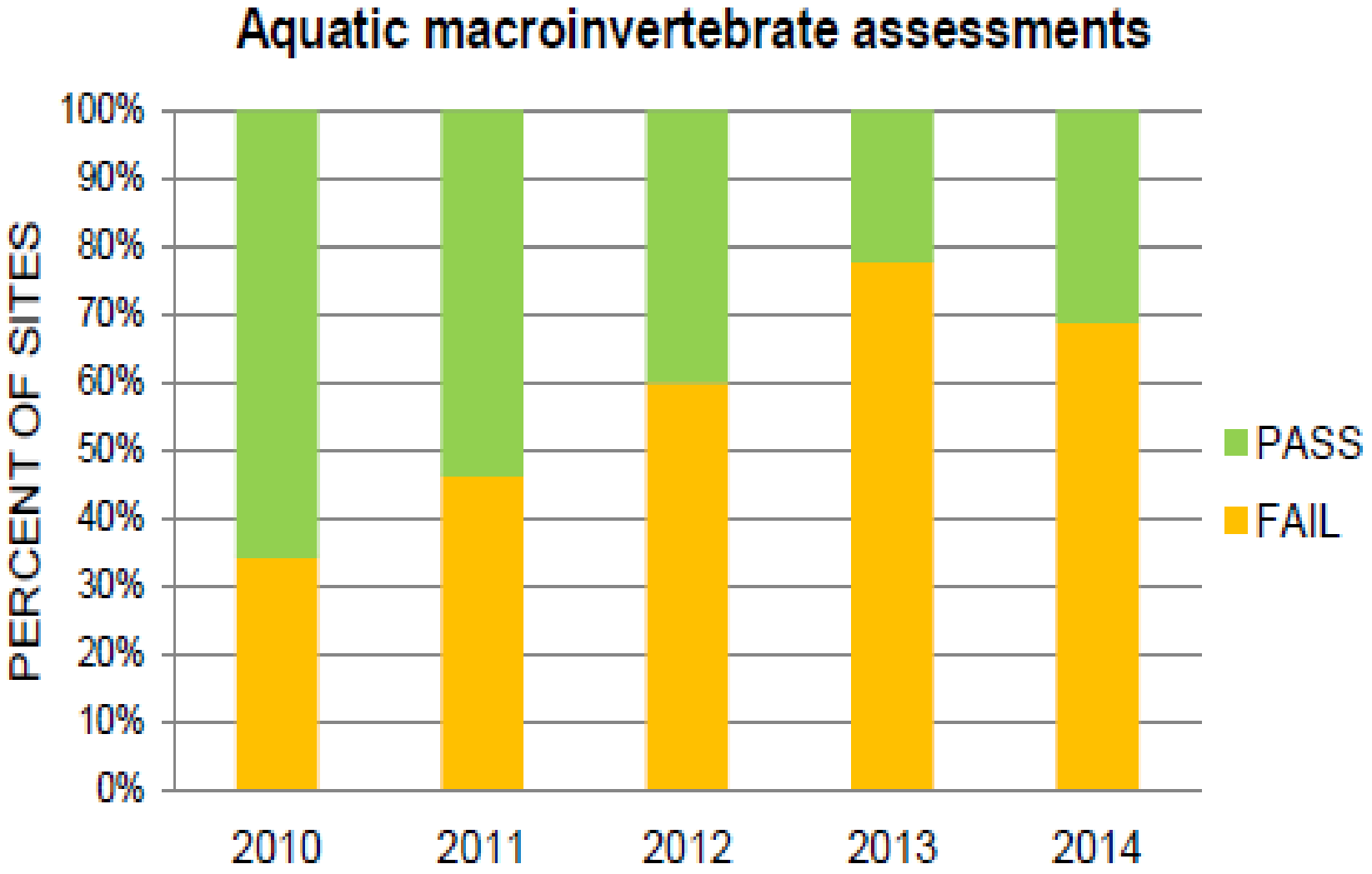


Figure 7. Aquatic macroinvertebrate community status, shown by sample year

Summary

- Biggest impairments continue to involve bacteria, sediment & nutrients
- Point source controls are effective but only influence a portion of the hydrograph and a portion of the geography
- Because of Kansas demographics (#13 in size; #33 in population); water quality in Kansas is driven by land use
- Non-point sources are the biggest contributor of pollutants
- Non-point source reduction is part science, part technology, part sociology
- WRAPS represents a comprehensive means of targeting NPS reductions