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Blue-Green Algae Blooms and the Kansas Nutrient Reduction Framework

Joint Energy and Environment Policy Committee

November 13, 2012

Acronyms

Kansas

- BGA – Blue Green Algae
- HAB – Harmful Algae Bloom
- N – Nitrogen
- NPS – Nonpoint Source
- P – Phosphorus
- PWS – Public Water Supply
- TMDL – Total Maximum Daily Load
- TN – Total Nitrogen
- TP – Total Phosphorus
- WRAPS – Watershed Restoration & Protection Strategies

Joint Committee on Energy and Environmental Policy
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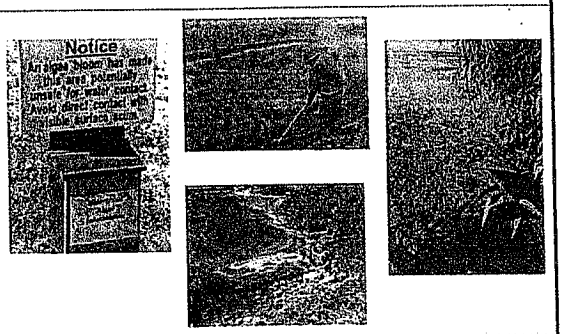
Attachment 4

Impaired Reservoirs – BGA/HAB

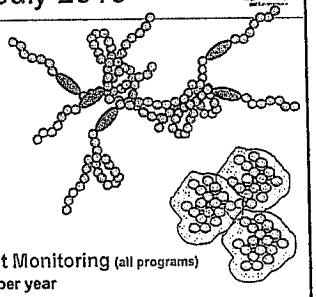
Kansas



HAB Work Since July 2010

Kansas

- Lakes (HAB only)
  - 2010 = 9
  - 2011 = 39
  - 2012 = 40
  - Total 2010 to 2012 = 61
- Algae Samples (HAB only)
  - 2010 = 132
  - 2011 = 248
  - 2012 = 206
  - Total 2010 to 2012 = 586
- Sample Load for Ambient Monitoring (all programs)
  - 220 to 250 algae samples per year



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Results – Human Cases

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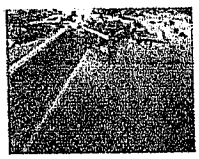
- June 1st – October 1st, 2011
- Human cases (n = 13)
  - –1 suspect
  - –5 probable
  - –7 confirmed
    - 71% (5/7) from one reservoir



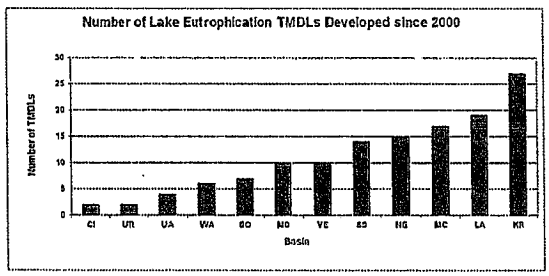
Confirmed Human Cases

Kansas

- Median age, 40 years (range 17-63)
- 71% (5/7) male
- 29% (2/7) hospitalized
- No deaths
- Primary symptoms
  - 71% (5/7), eye and upper respiratory irritation
  - 29% (2/7), rash
  - 14% (1/7), gastrointestinal

Lake Eutrophication TMDLs

Kansas



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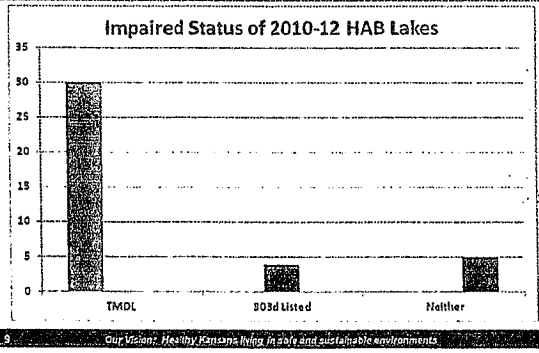

KS Narrative Criteria Provide Indicators

- The introduction of plant nutrients into surface waters designated for domestic water supply use shall be controlled to prevent *interference with the production of drinking water* (K.A.R. 28-16-28e(c)(3)(D)).
- The introduction of plant nutrients into streams, lakes, or wetlands from artificial sources shall be controlled to prevent *the accelerated succession or replacement of aquatic biota or the production of undesirable quantities or kinds of aquatic life* (K.A.R. 28-16-28e(c)(2)(A)).
- The introduction of plant nutrients into surface waters designated for primary or secondary contact recreational use shall be controlled to prevent *the development of objectionable concentrations of algae or algal by-products or nuisance growths of submersed, floating, or emergent aquatic vegetation* (K.A.R. 28-26-28e(c)(7)(A)).

Kansas Nutrient Reduction Plan

- Concepts
  - No doubt that nutrient reduction in surface water is needed
  - Numeric criteria do not add value to the process at this time
    - Establish cause/effect relationships through WRAPS/TMDLs
    - Manage reductions adaptively
    - Likely to delay water quality improvements
      - Arguments over the "right" numbers – as in Florida
  - NPS largely unregulated – criteria won't change that
    - Still must find ways to implement reduction measures
    - Cooperative implementation pays more dividends
  - Protect downstream waters
    - Particularly Gulf of Mexico and Oklahoma reservoirs
  - Protect in-state waters
    - Particularly drinking water reservoirs

Kansas Nutrient Framework

- First P, then N later
  - 1. Prioritize Watersheds
  - 2. Set Load Reduction Goals
  - 3. Effective NPDES in Targeted Watersheds
  - 4. Target Effective Ag Management Practices
  - 5. Small Town Stormwater & On-Site Wastewater
  - 6. Accountability through Tracking
  - 7. Annual Reporting for Targeted Sub-Watersheds
  - 8. PWS Lake Chlorophyll Criteria, P & N later

Priority HUC 8s & HAB Lakes

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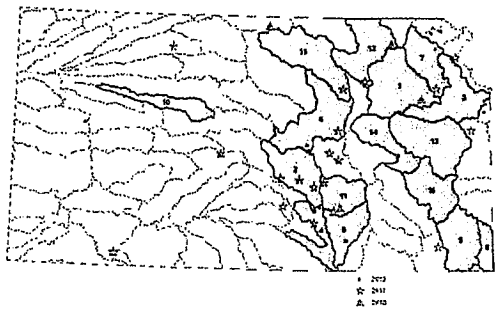


Nutrient Reduction Plan - NPDES

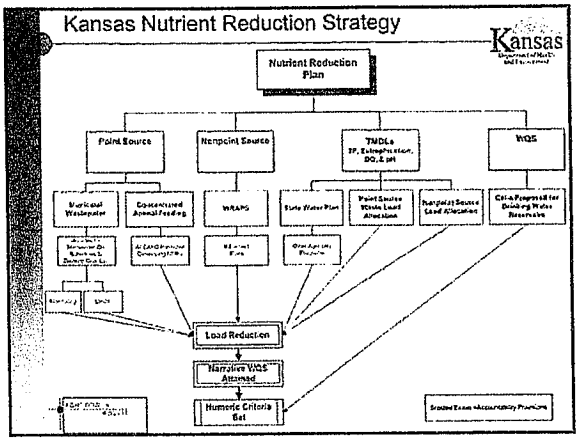
Kansas

- Rely on State Water Plan to Direct Effort
  - Promote an iterative and adaptive approach to reduction
    - Use current narrative nutrient criteria
    - Initially, set goal of 30% reduction of TN & TP export
    - Technology-based limits for point sources [current TP ~ 4-6 mg/l]
      - Biological Nutrient Removal ~ 1.5 mg/l TP
      - Enhanced Nutrient Removal ~ 0.5 mg/l TP
      - Limits of Technology ~ 0.3 mg/l TP
    - Subsequently, develop and implement eutrophication/nutrient TMDLs – Reset the Loading Budget; Set the Sequence of Actions
    - Direct Watershed Restoration And Protection Strategies at NPS
    - Ultimately, Secure Progress with Basin-Specific Criteria

Nutrient Reduction Plan - NPS

Kansas

- Typically, greatest proportion of nutrient load
- Focus NPS $$ on most critical areas
  - Identify areas with potential surface water impacts
  - Identify priority areas
- Identify technical fixes
  - Manure management
  - Soil testing/Data interpretation
  - Soil management
  - Fertilizer application
  - Filter Strips and buffers



Next Steps toward Nutrient Reduction

Kansas

- Establishing a 10-year vision strategy for TMDLs
- Emphasis is on nutrient impairments in the 16 HUC 8's
- Milford Lake TMDL to be done in 2013
- Revision of past lake TMDLs to update reduction goals and responsibilities
- Begin attacking the stream phosphorus loadings; will benefit downstream lakes [Big Creek, Prairie Dog Creek]
- Looking for programmatic milestones in 2018
- Looking for trends of decreased chl a and reduced BGA outbreaks in lakes by 2022
- Seizing opportunities to reduce nutrients: wastewater technologies, WRAPS watershed plans, nutrient CREP

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