Welcome

Illinois River Watershed
Total Phosphorus Criterion Revision

Stakeholder Webinar 2
September 22, 2020

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Webinar Logistics

Questions

- ✓Type all questions into the “Q & A” toolbar. Q & A will be held at 3 break points during the presentation.

- ✓A recording and copy of the presentation will be posted on OWRB website

http://www.owrb.ok.gov/

OWRB Staff Introductions

- **Bill Cauthron**, Water Quality Division Chief
- **Monty Porter**, Water Quality Division Assistant Chief & WQS Coordinator
- **Rebecca Veiga Nascimento**, WQS Environmental Program Manager
- **Jade Jones**, WQS Environmental Specialist III

Illinois River Watershed TP Criterion Revision

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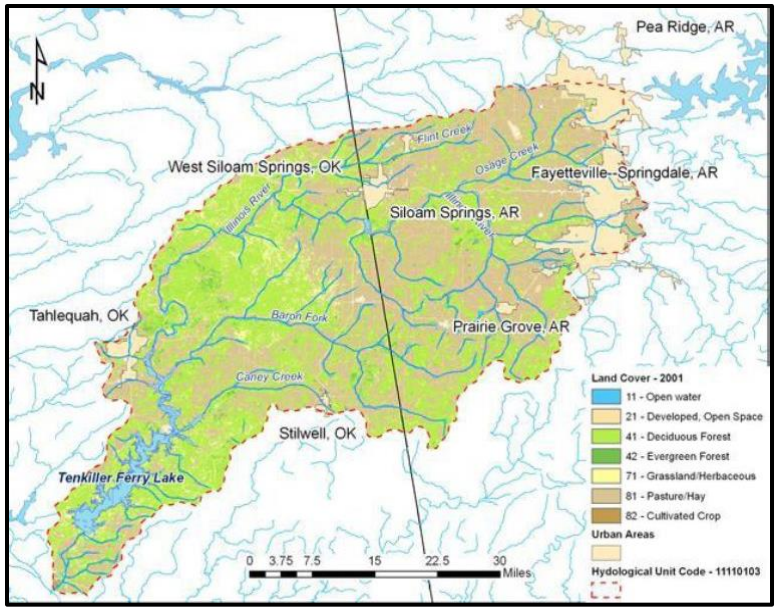
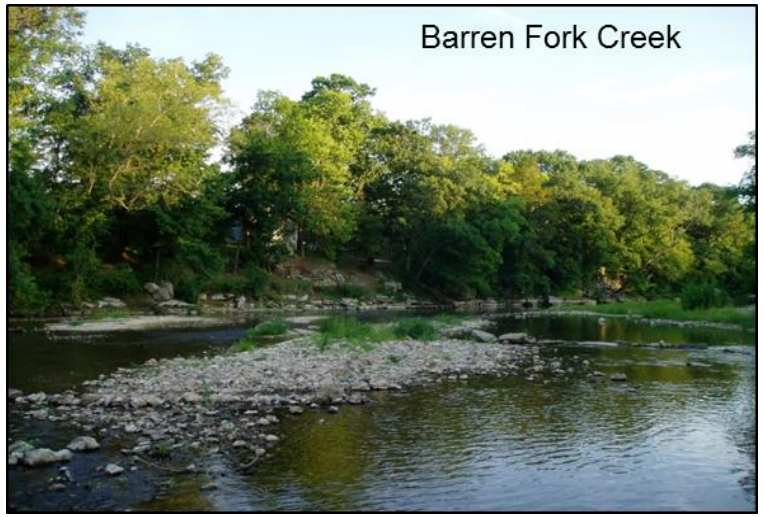
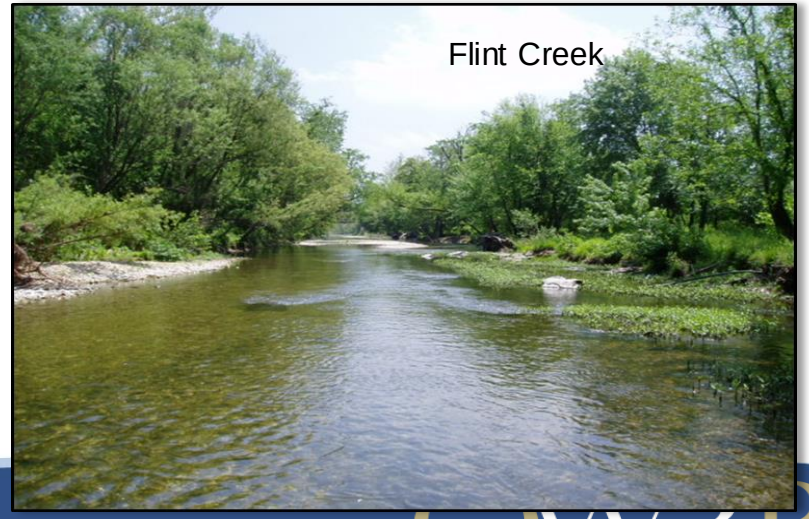
Outline

- Background
- Draft revised total phosphorus criterion
- **Question Break 1**
- Critical Condition
  - Total Flow
  - Ecosystem Process
- **Question Break 2**
- Calculating 6-month average
- Rulemaking Process
- **Final Questions**

Illinois River Watershed







Scenic Rivers

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Beneficial Uses

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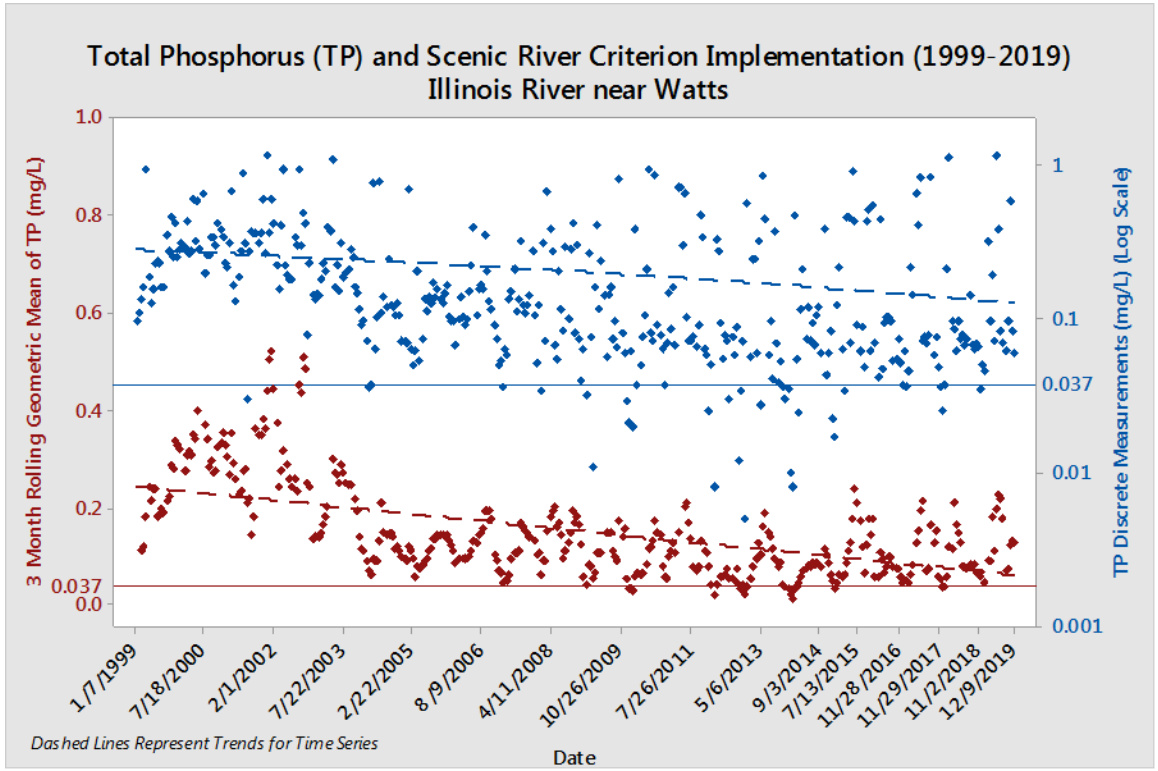
Aesthetic Beneficial Use

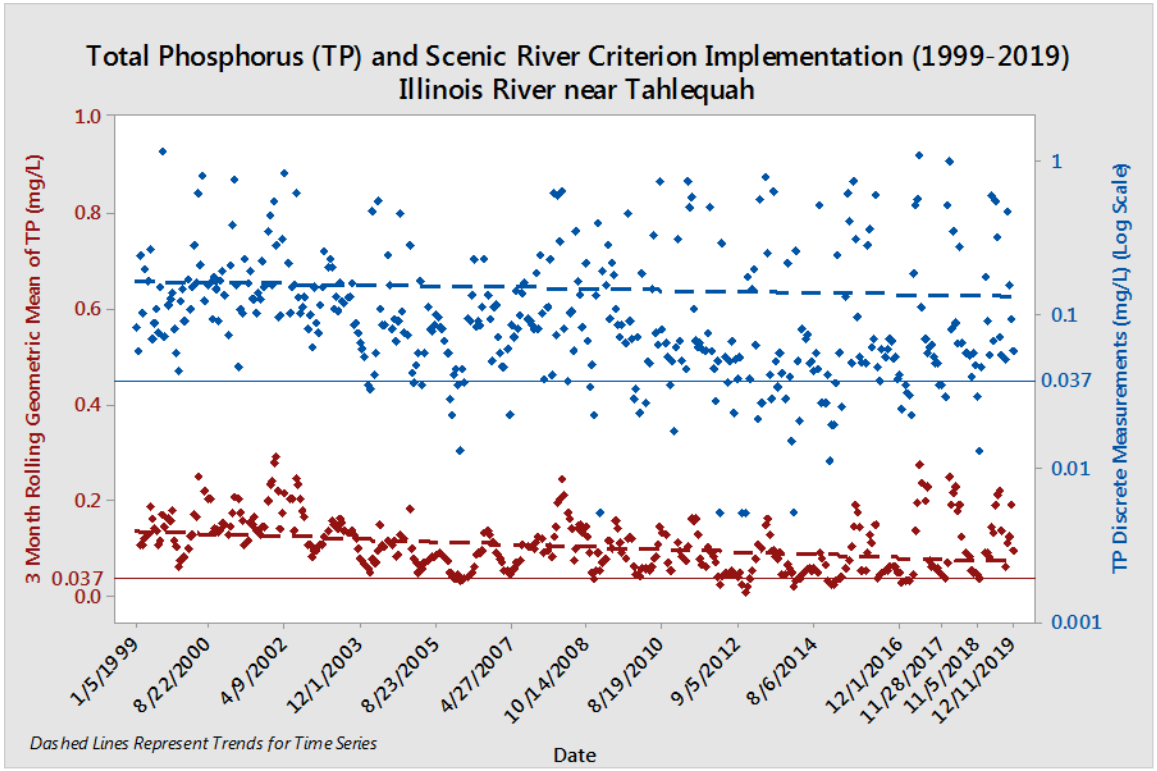
Illinois River at Watts

Total Phosphorus Concentrations

Illinois River at Watts



Illinois River at Tahlequah



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History: Total Phosphorus Criterion

2002 — Scenic River TP Criterion Adopted

- 0.037 mg/L, 30-day geo-mean

2003 — 1st Statement of Joint Principles

- OK & AR agreed to coordinated, but individual state actions to reduce phosphorus

2012 — Re-evaluation TP Criterion

- Technical re-evaluation of phosphorus criterion
- Technical Advisory Group (TAG), OK confirmed the Scenic River TP criterion
- AR TAG members drafted minority report

2013 — 2nd Statement of Joint Principals

- Reconcile differences regarding TAG findings
- Formed Joint Study Committee
- Special Study on phosphorus & algae growth conducted

2018 — MOA

- OK & AR working together on various actions to improve water quality

2013 Second Statement of Joint Principals

Formed 6-person Joint Study Committee

Responsible for overseeing study on phosphorus & algae

June 2014 - April 2016, Ryan King with Baylor University conducted study

December 2016, Committee Final Report & Recommendations accepted by both state Governors

OWRB staff & partners working to address committee recommendations

Joint Committee Recommendations

- 2 Recommendations
  1. Water quality criteria
  2. Ambient water quality monitoring

A six-month average total phosphorus level not to exceed 0.035 mg/L based on water samples taken during the CRITICAL CONDITION

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Interagency Cooperation

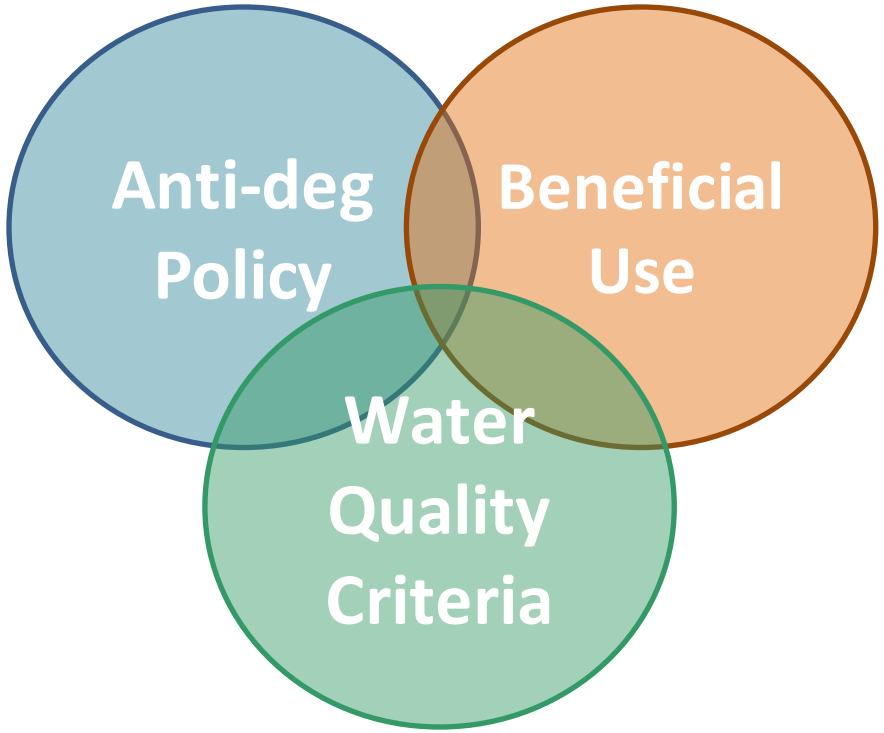
OK Agencies & Tribal Partners

- Extensive technical & general information meetings
  - 3 completed
  - Additional expected
- General communication & info exchange, as needed

Arkansas Division Environmental Quality

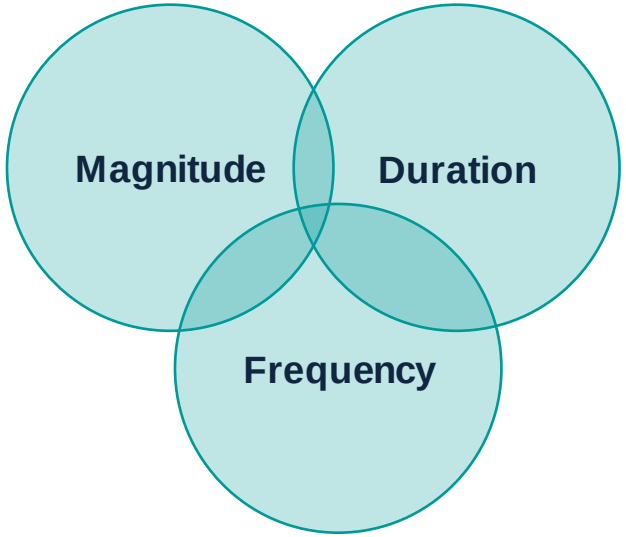
- Technical meetings, bimonthly since March 2019 & currently as needed
- General communication & info exchange, as needed
- Cooperation on stakeholder outreach

Water Quality Standard



- Beneficial Use
  - Aesthetics
- Water Quality Criterion
  - Total Phosphorus
- Antidegradation Policy
  - Scenic River
  - Outstanding Resource Water

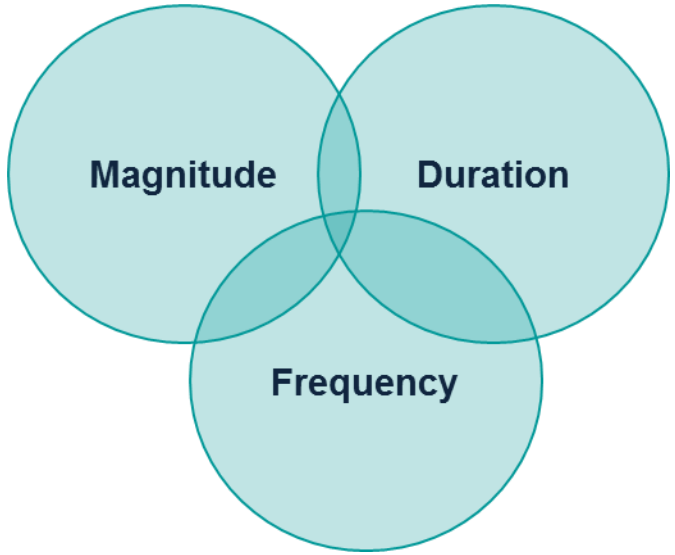
Water Quality Criteria



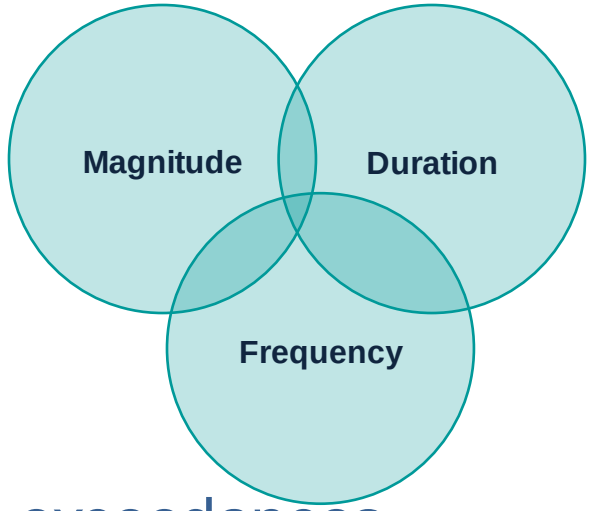
- **Magnitude**
  - Remain at 0.037 mg/L TP
  - Magnitude (0.035 mg/L TP) recommend by committee is not considered “significantly different” under the Second Statement of Joint Principals

Water Quality Criteria - Duration

- Evaluated & confirmed 6-month average with OWRB long term data sets
- 6-month average will be protective and reasonable



Water Quality Criteria



- **Frequency**
  - Committee Recommended, "*not to exceed*"
    - Waterbodies have resiliency and can withstand infrequent exceedances
    - Not effective for implementation programs
  - OWRB staff recommend limited exceedance approach with 2 components for short term & moderate term protection
    - No more than 1 exceedance per 1-year period
    - No more than 3 exceedances per 5-year period

Draft Criterion

The total phosphorus **six month rolling average** of **0.037 mg/L** shall not be exceeded more than **once in a one-year period** and not more than **three times in a five-year period**.

Question Break 1

Barren Fork Creek

Critical Condition

- New requirement not previously in OK Water Quality Standards
- Committee definition

"the conditions where surface runoff is not the dominant influence of total flow and *stream ecosystem processes."*

Critical Condition

"the conditions where surface runoff is not the dominant influence of total flow and *stream ecosystem processes."*

1. What does this mean?

2. We need an operational definition that can be implemented across 2 states and various monitoring programs

Critical Condition

Break critical condition language into 2 parts & created 2 analysis to consider each part

1) *the conditions where **surface runoff** is **not** the **dominant influence** of **total flow***

&

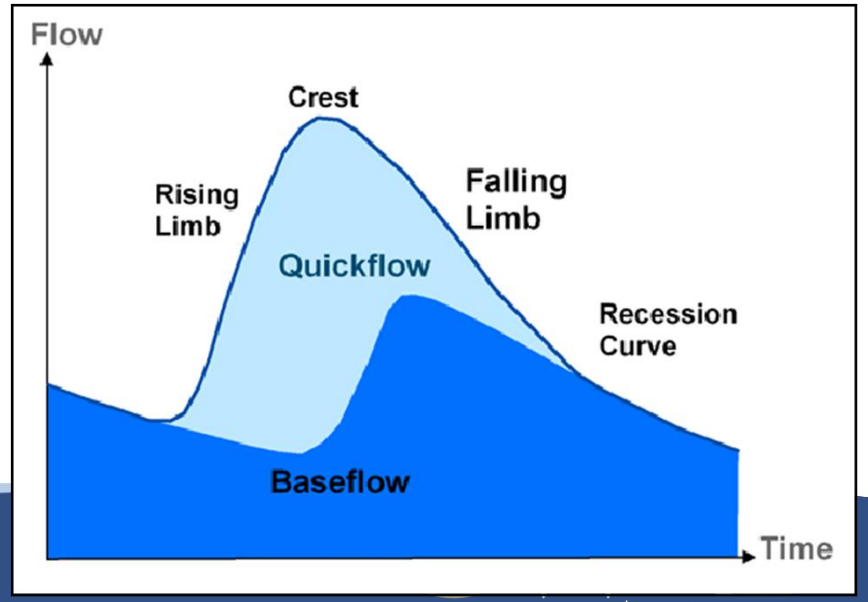
2) *the conditions where **surface runoff** is **not** the **dominant influence** of **stream ecosystem processes***

Critical Condition Analyses

1. Total Flow

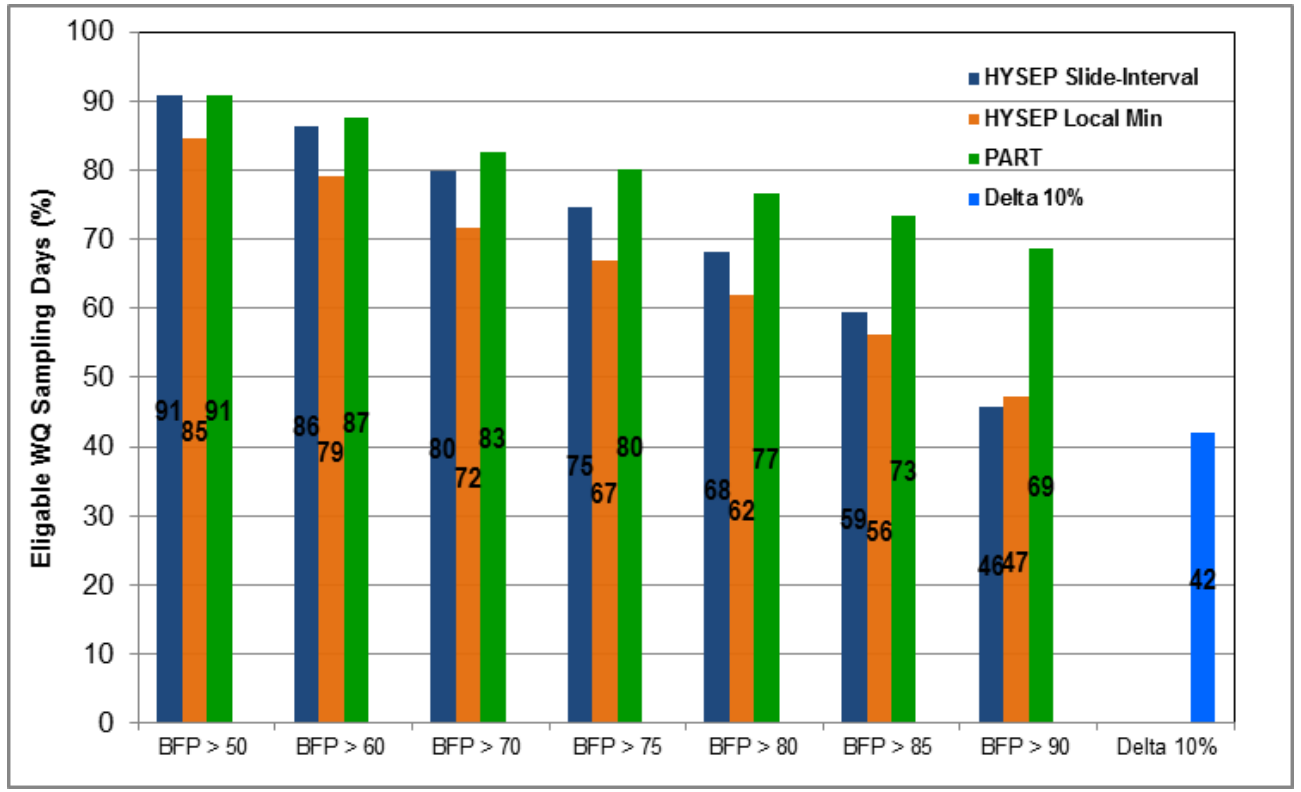
Hydrograph separation analysis to evaluate flow conditions & when is surface runoff dominant and when is it not

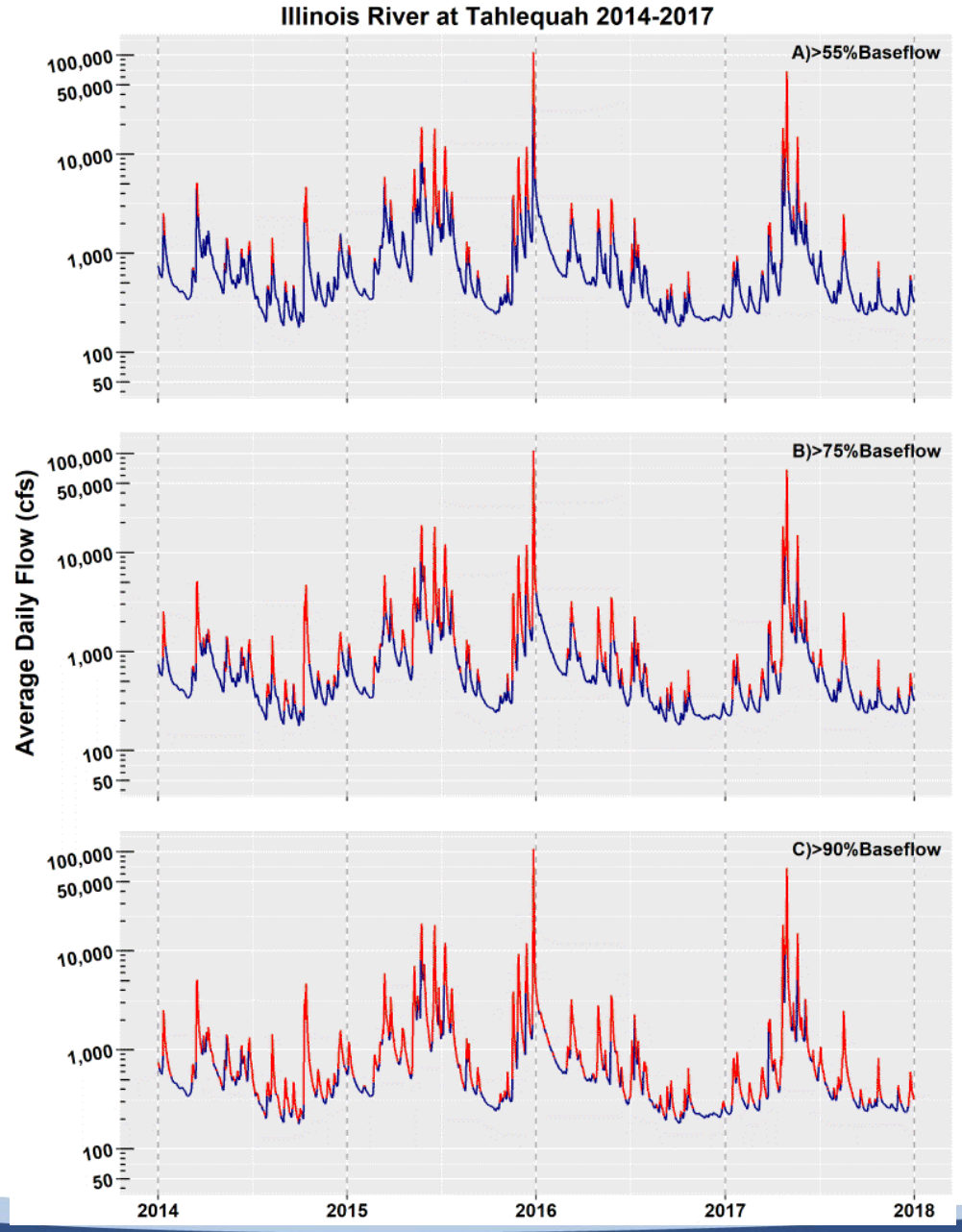
- Effectively & efficiently identify surface runoff versus baseflow conditions
- Utilized USGS gages throughout watershed
- Consistent approach applicable watershed wide



Critical Condition Analyses

- What is the population of days that will satisfy critical condition term?
- Daily Average flow from 2008-2018
- Run hydrograph separation method from GW toolbox
  - Provides streamflow, baseflow, and baseflow percent
- Evaluate baseflow percentage at various thresholds





- Where does the population of days at different baseflow percentage threshold fall on the hydrograph?

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Critical Condition Analyses

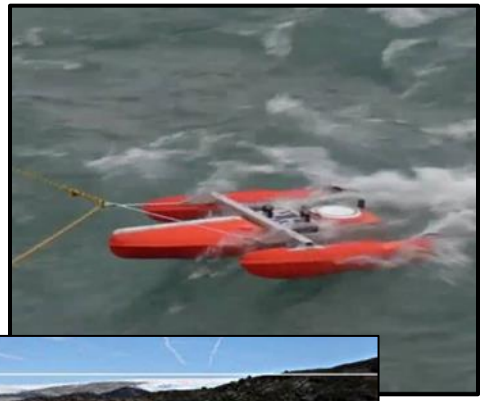
2. Stream Ecosystem Process

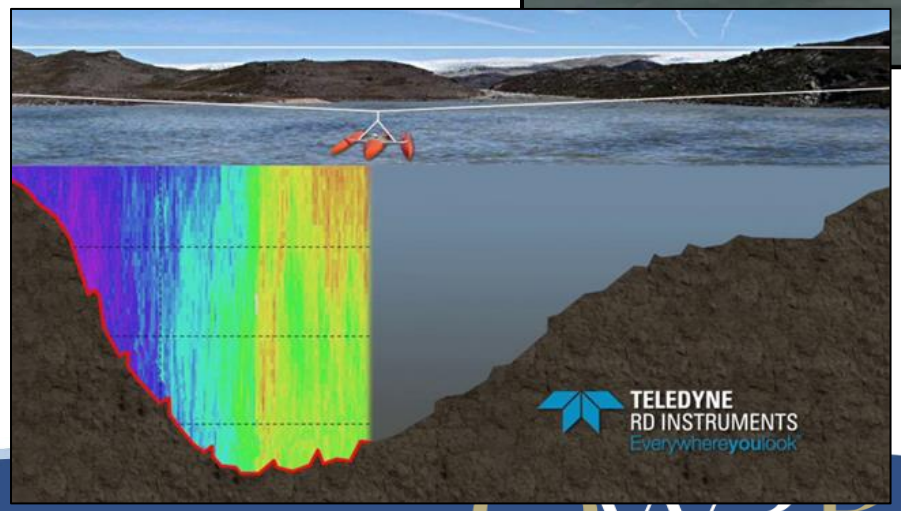
Hydrology scour analysis to determine when flow dominates ecosystem process of interest, which is benthic algal growth

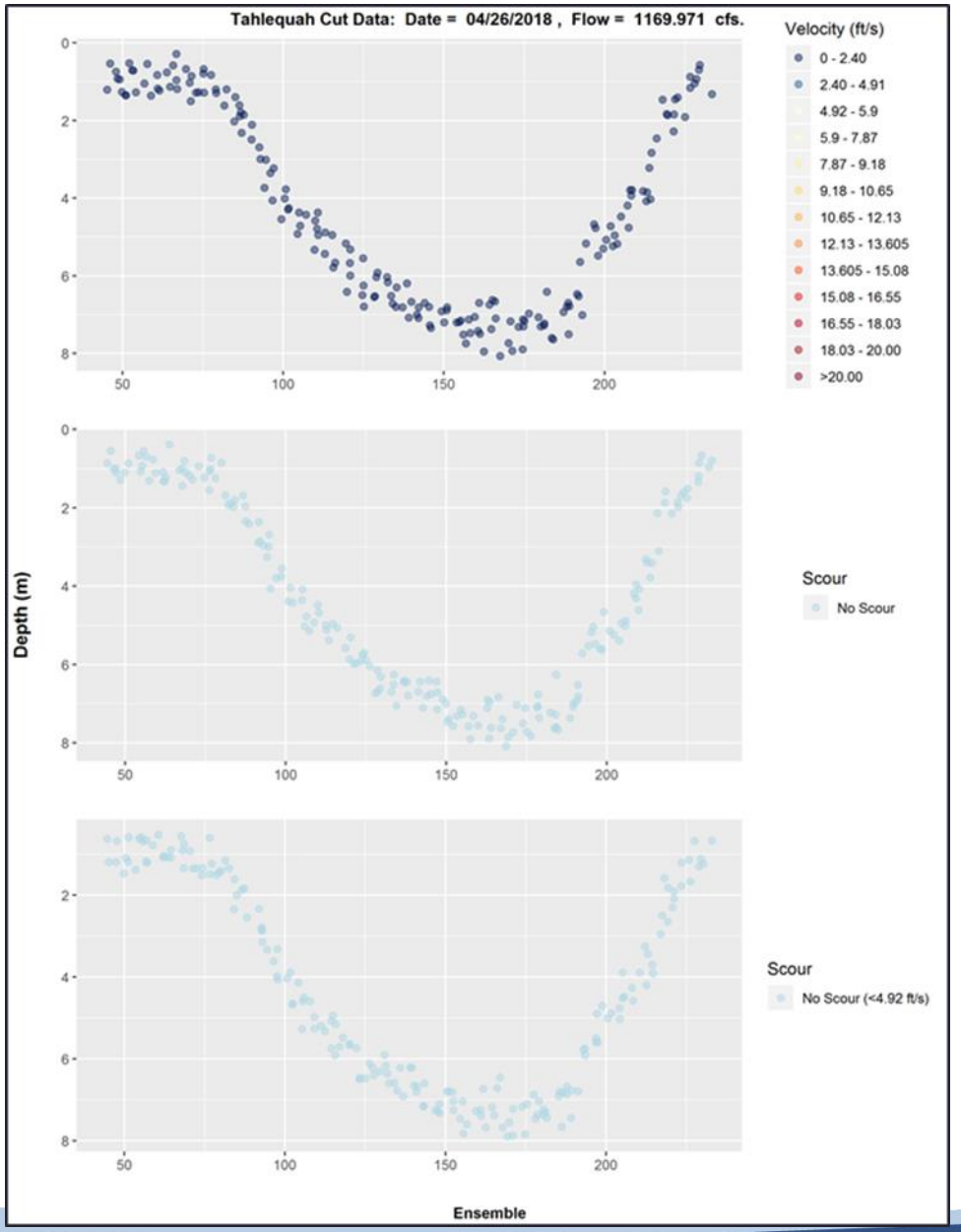
- When are near bed velocities strong enough to scour algae?
- Can we relate the near bed velocities to discharge?

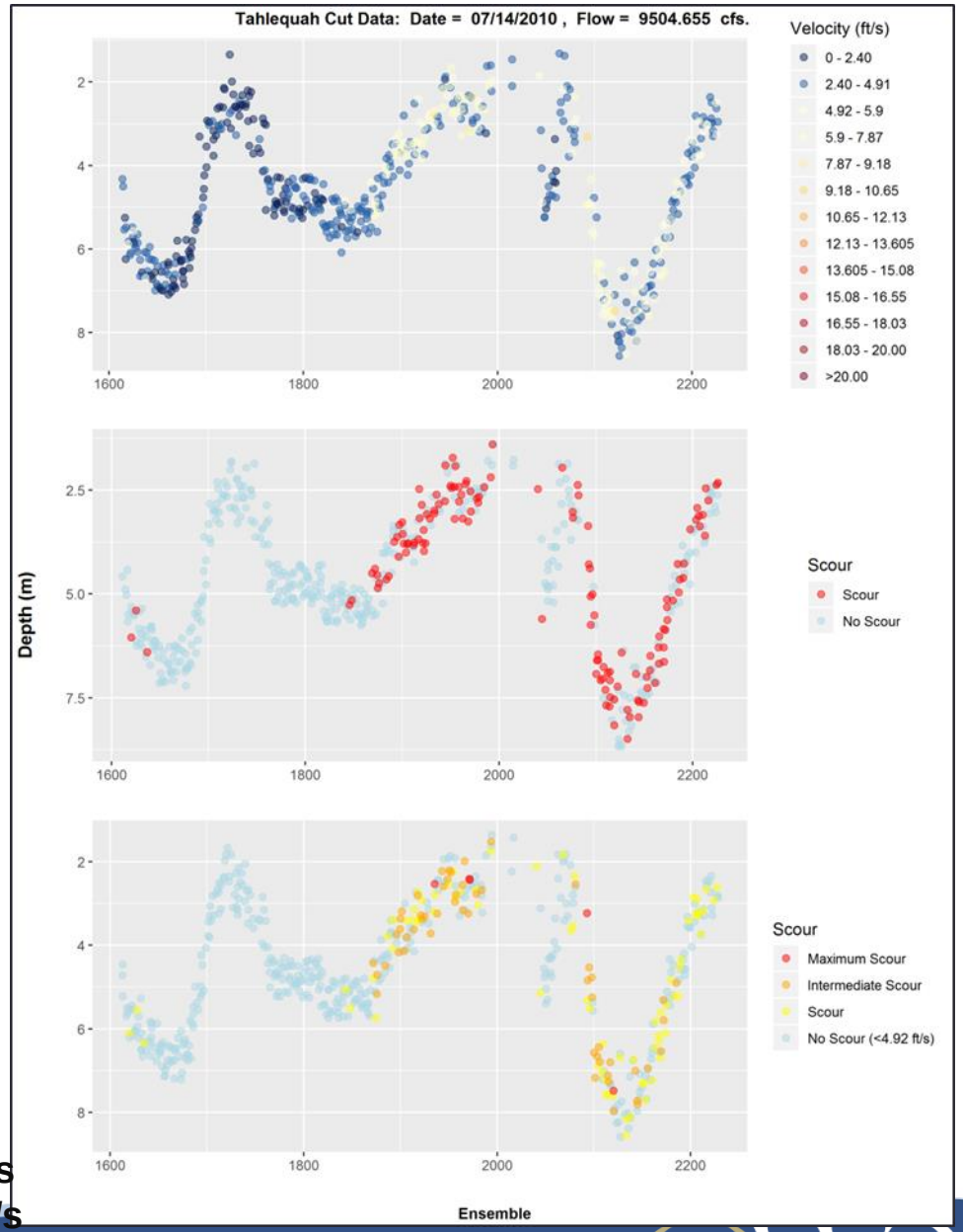
A

B









Max: 8 ft/s
Inter: 6 ft/s
Scour: 5 ft/s
No Scour: <5 ft/s

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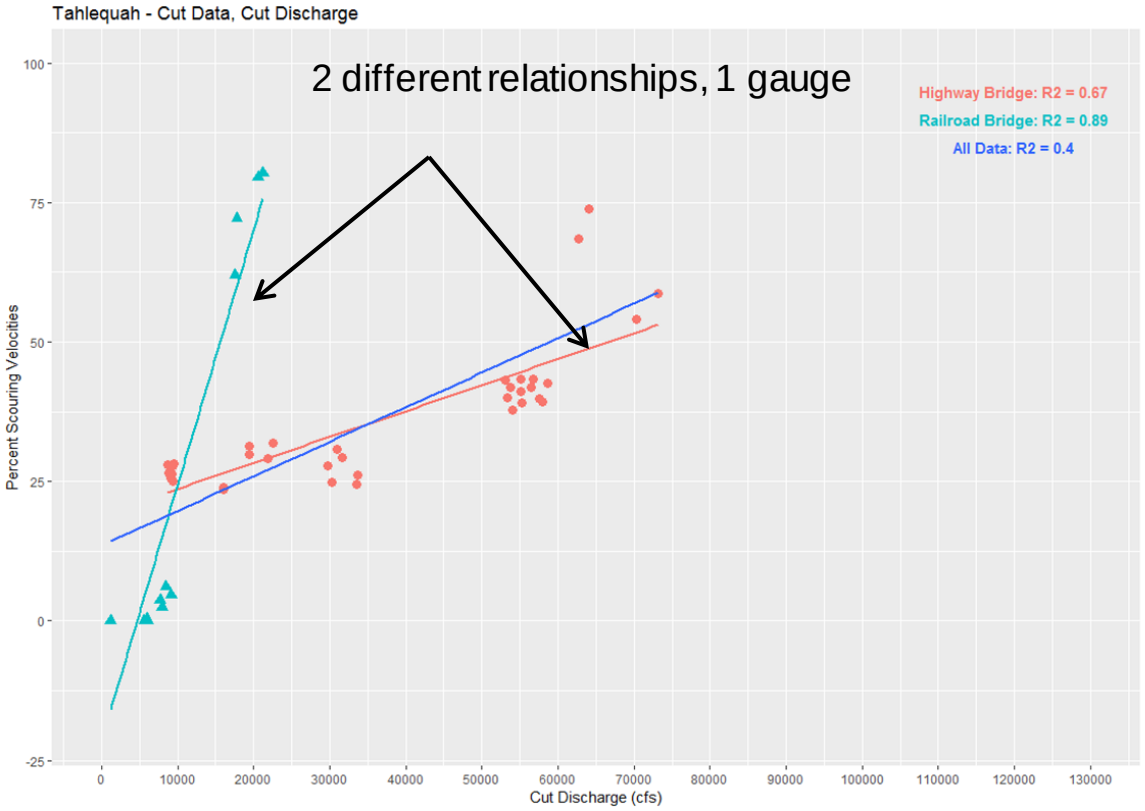
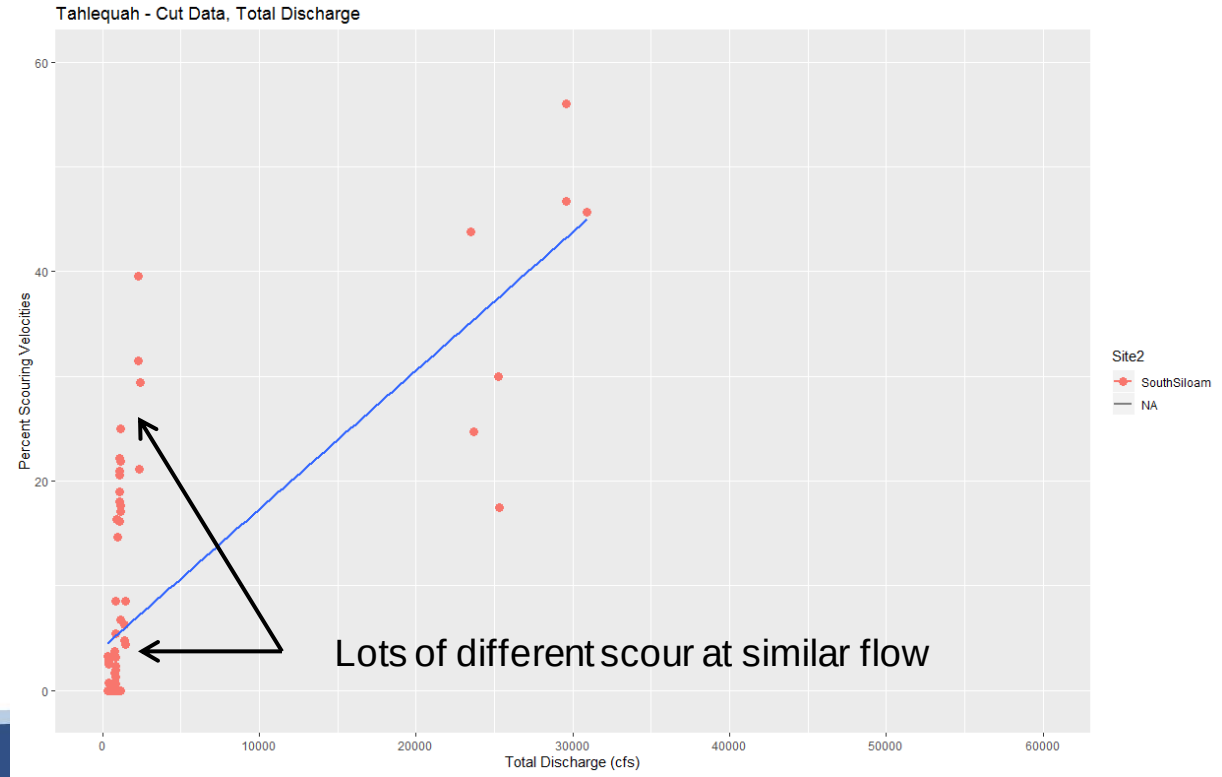


Tahlequah

- Can not consistently relate scour velocity with discharge

South Siloam Springs



Outcome of Critical Condition Analyses

Scour Analysis Results

- Results very dynamic and highly variable
- Not consistent across watershed
- Analysis very labor intensive
- Not effective for operational definition

❖ Hydrograph separation analysis will provide foundation for interpretation of critical condition language

❖ Staff finds that a 55% baseflow threshold would reasonably address the critical condition recommendation

❖ Only apply to WQ assessment for 303(d) & 305(b)

Question Break 2

Tahlequah Creek

Calculating 6-month average

- How many measured TP values (*"n"*) required for each 6-month average?

- How many 6-month averages ("*N*") per year?
  - 6-month rolling average calculated on monthly basis
  - Maximum of 12, 6-month averages per year

Calculating 6-month average

- Reviewed monitoring programs, found that at least 80% of time at least 1 measured TP value per month available

2 Goals

1. Monitoring programs need some flexibility, no program is perfect
2. Maximize the number of 6-month averages ("N") calculated each year

❖ Requiring at least **4 measured TP values for each 6-month average** calculation attains both of these goals.

Assessing 6-month averages

- How many 6-month averages ("*N*") required for beneficial use assessment

– Frequency

- 1-year
  - – No More than 1 exceedance per 1-year period
- 5-year
  - – No More than 3 exceedances per 5-year period

❖ Current OK Assessment Protocol

- Minimum of 10 samples…..
- Considering minimum of 10 6-month averages ("N") per year

Lake Tenkiller

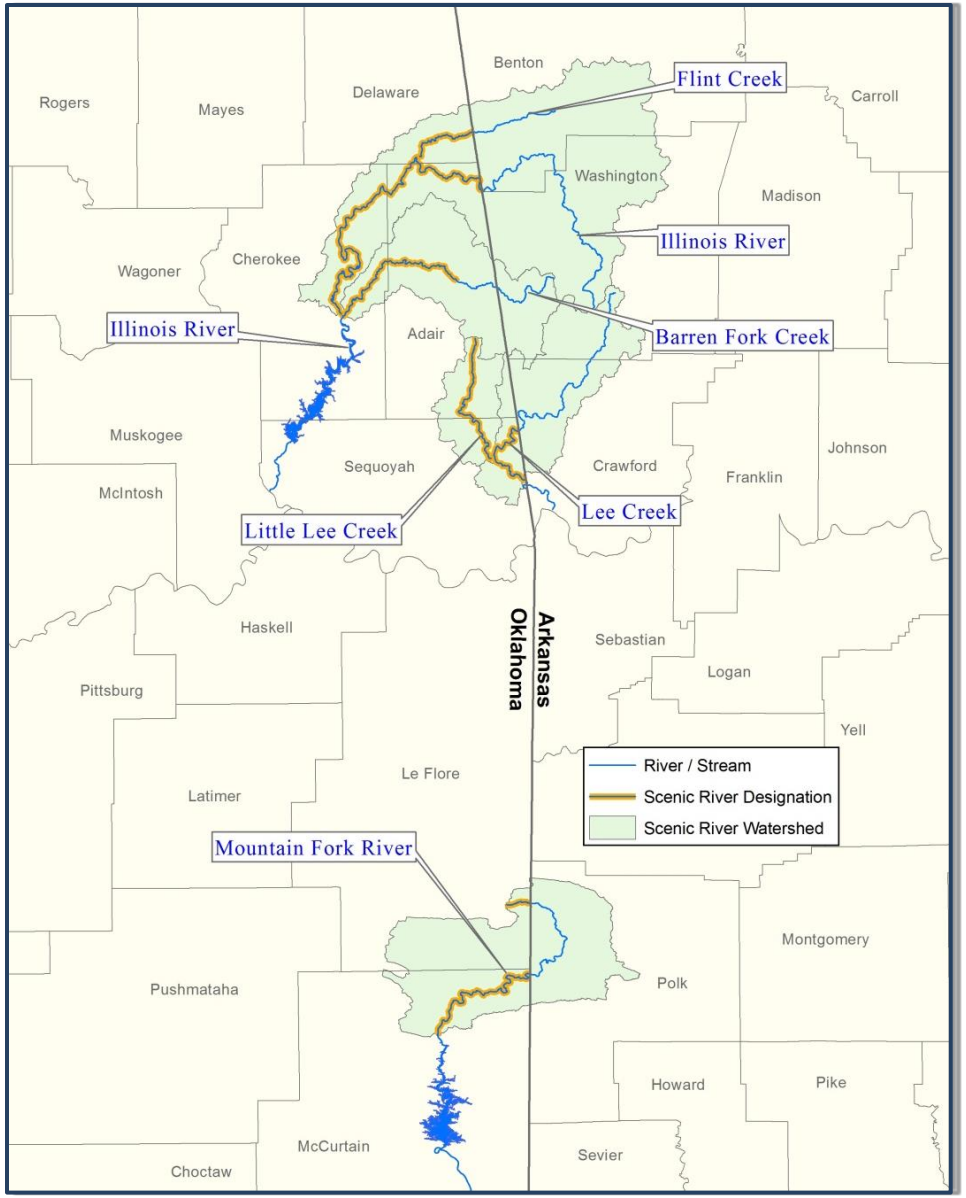
- Beneficial Uses
  - Recreation
  - Aesthetics
  - Fish & Wildlife Propagation
  - Fish Consumption
  - Water Supply
- Criteria
  - Dissolved oxygen
  - Chlorophyll
  - Aquatic life
  - Human health
- Reducing watershed phosphors load benefits Lake Tenkiller
  - This is a key watershed management activity
- Illinois River TP criterion is not applicable to Lake Tenkiller

Rule Changes

- 6 scenic rivers, changes only apply to Illinois River Watershed

- Chapter 45
  - ✓ Revised water quality criteria

- Chapter 46
  - ✓ Critical condition operational definition
  - ✓ Use Assessment Protocol, changes accommodate monitoring programs



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Stakeholder Participation

- We value stakeholder participation and want to hear from you!
  - ❖ **Contact us directly with questions**
  - ❖ **Webinars**

    October 6th at 7:00 pm
  - ❖ **Website**

    http://www.owrb.ok.gov/rules/wqs/revisions/totalphosphorous.php
  - ❖ **Email Notices – GovDelivery**

    https://public.govdelivery.com/accounts/OKWRB/subscriber/new?qsp=CODE_RED

Rulemaking Schedule

- **December 2020 Draft Rules published in OK Register and formal public participation process starts**

Activity	Timeframe
Governor & OSEE review of draft rules	November 2020
Draft Rules Published in OK Register	December 2020
OWRB Public Hearing & Public Comment Period	**January 2021**
OWRB Meeting & Rule Consideration	**February 2021**
Legislative & Gubernatorial Review	Spring 2021
Rules Become State Law	September 2021
EPA Approval	February - March 2022

Final Questions

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