# Oklahoma Conservation Commission 2014 Monitoring Update

**Jason Ramming**
**Oklahoma Conservation Commission**
**Water Quality Division**

# Oklahoma Conservation Commission, Water Quality Division

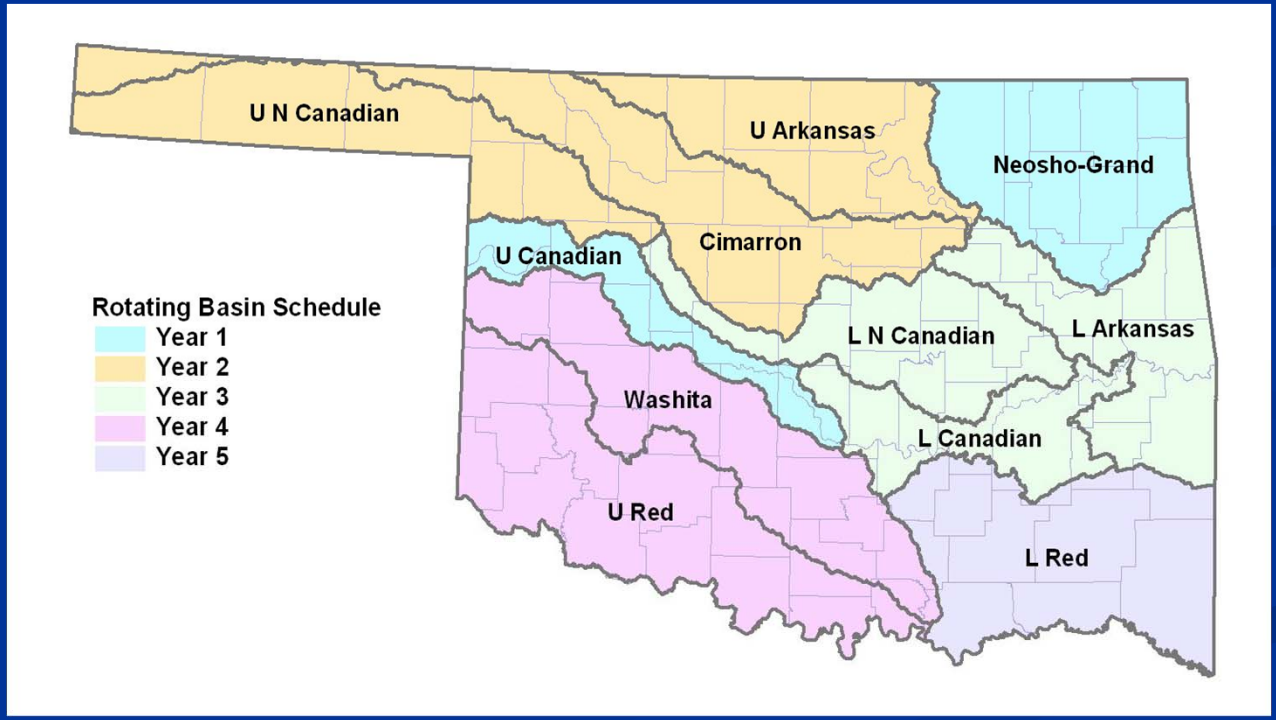
- Technical lead for NPS pollution assessment and identification in OK
- Small to mid-sized, wadeable streams and rivers

# OCC Monitoring Purpose

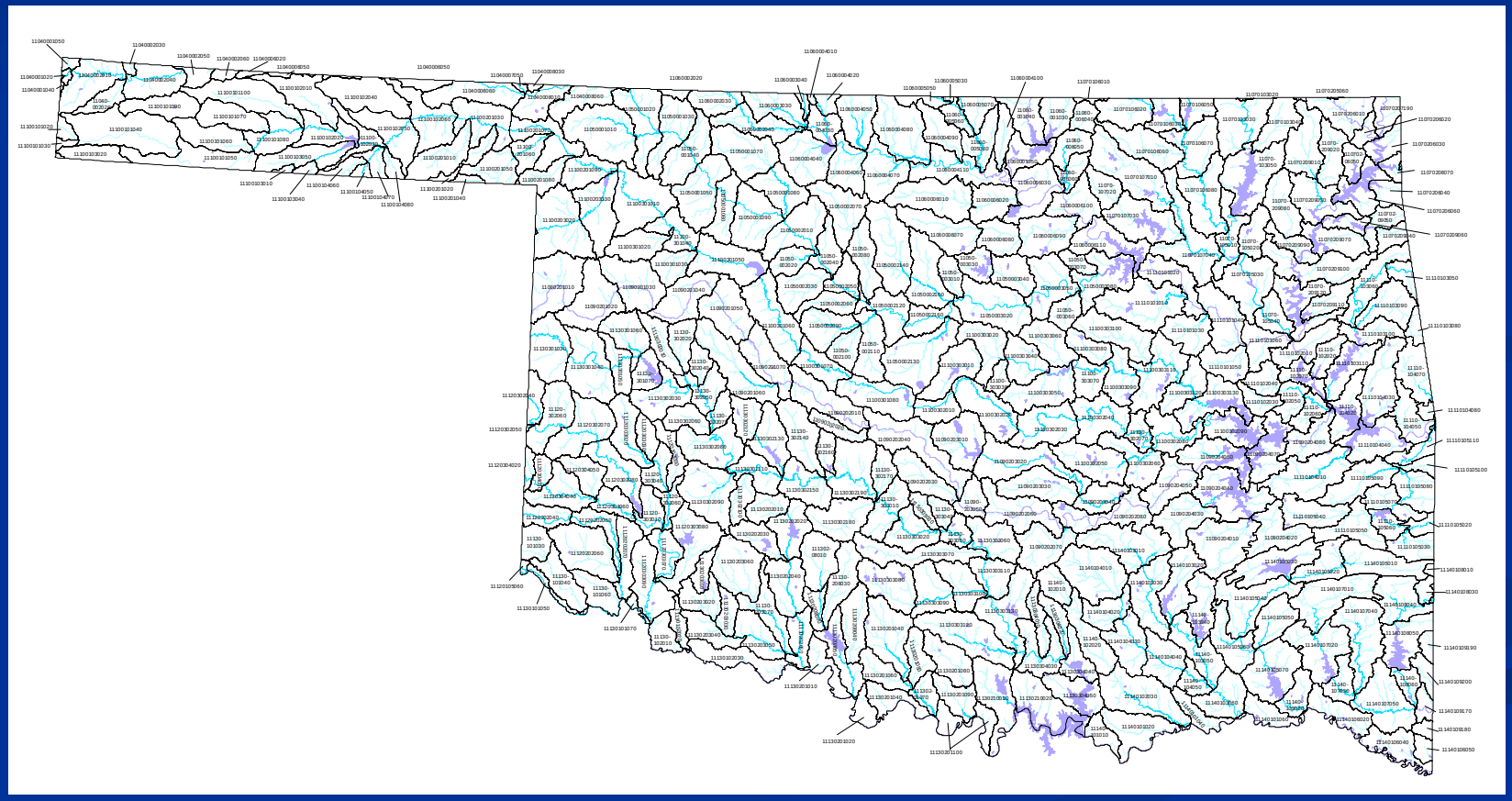
- The OCC implements an extensive and unique monitoring program, conducting several distinct types of activities primarily focused on determining the extent, nature, and probable source(s) of NPS pollution in the state.

# Historical Overview of the OCC Rotating Basin Project Design

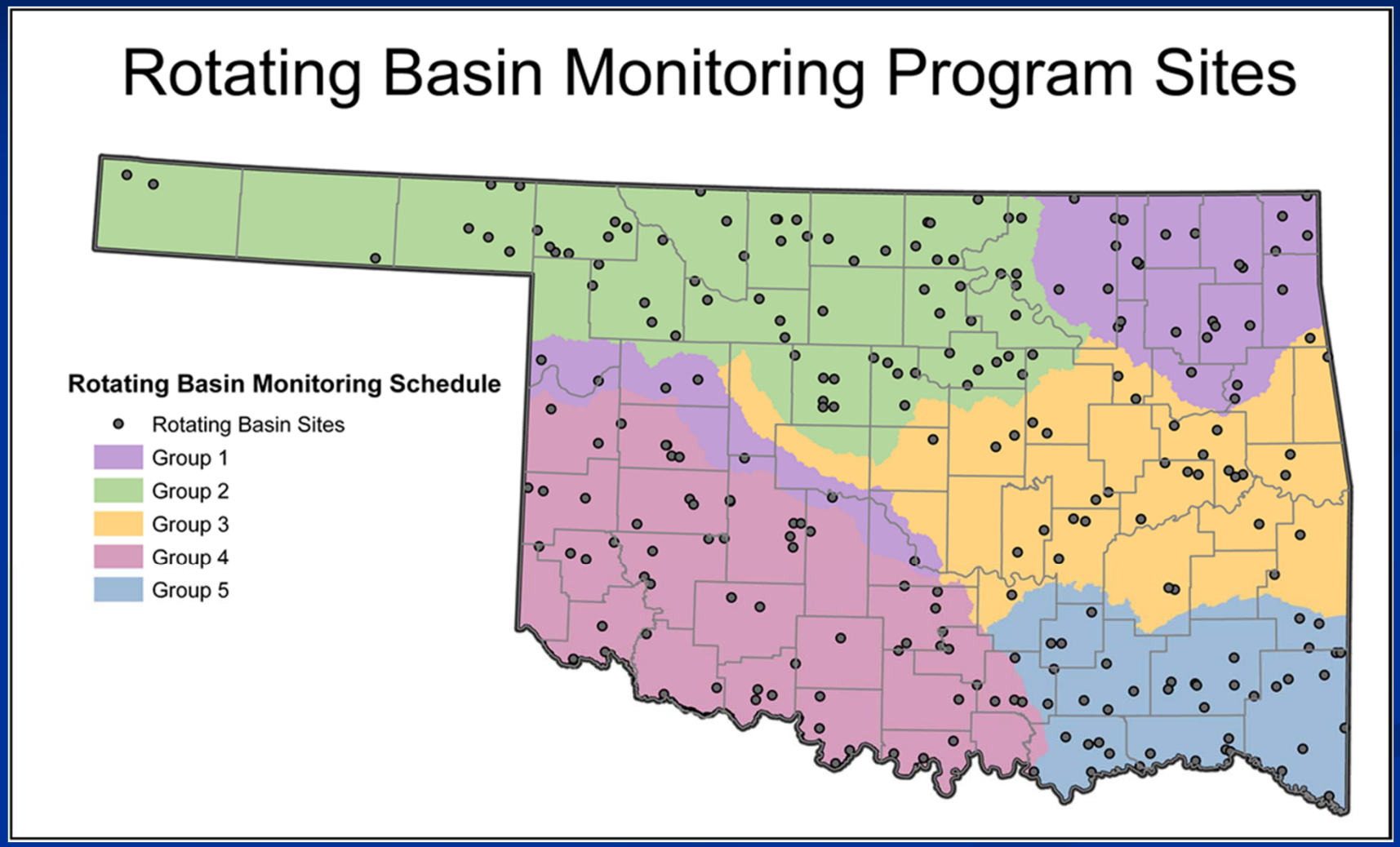
- Concentrate efforts in a planning basin or basin groups
  - Oklahoma has 11 planning basins
- Rotate through the entire State every 5 years
  - Begin 1-3 new basins each year



- **Cooperate to monitor every USGS HUC 11 watershed**
  - **OCC monitors about 250 HUC 11 watersheds**
- **Monitor at the lowest practical outlet for each HUC 11**
  - **Monitoring occurs at or near road crossings**



# Rotating Basin Sites



# How are sites chosen?

**Outlets of HUC-11 watersheds located entirely in OK**

**Must have perennial water**

**Not part of a watershed being sampled by another agency**

**Tributaries of large river segments**

**When there are multiple suitable streams in a watershed, an effort is made to monitor a stream draining an area of land use different from the majority of the other streams being monitored in that region**

# 4 Stages in Rotating Basin Program:

- Ambient monitoring
- Diagnostic monitoring
- Implementation monitoring
- Success monitoring

# Why monitor small streams?

**Good way to narrow down causes/sources of impairment**

# Monitoring Protocol: Physico-chemical Parameters

## Every five weeks (ten times a year)

**In Situ parameters:**

- water temperature
- dissolved oxygen
- pH
- alkalinity
- hardness
- specific conductance
- turbidity
- instantaneous discharge

# Monitoring Protocol: Physico-chemical Parameters

## Every five weeks (ten times a year)

## Laboratory parameters:

- nitrate, nitrite, total Kjeldahl nitrogen (TKN), ammonia
- orthophosphate, total phosphorous
- chloride, sulfate, TSS, TDS

# Monitoring Protocol: Biological Parameters

## Macroinvertebrates

- Twice a year (once in winter, once in summer)
- All available habitats: riffle, vegetation, woody

# Benthic Macroinvertebrates

(bottom-dwelling) (animals w/o backbones visible to naked eye)

*Heptageniidae sp.*
(Mayfly larva)

*Hydropsyche sp.*
(Caddisfly larva)

*Perlodidae sp.*
(Stonefly larva)

Great candidates for biological monitoring…

# BUG COLLECTION


Kicknet sampling


Vegetation sampling


Picking

# Monitoring Protocol: Biological Parameters

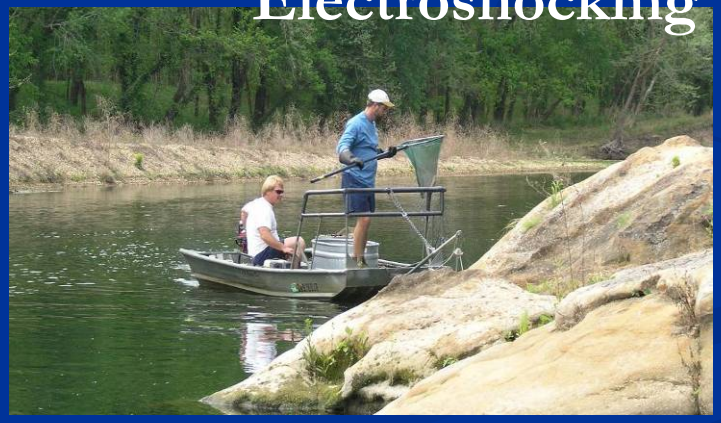
## Fish / Habitat

- Once every cycle
- Electroshock and seine
- 400 meters, total
- 20 meter transects for habitat assessment

# FISH COLLECTION

Seining

Electroshocking



# FISH IDENTIFICATION

The Oklahoma Conservation Commission conducts an annual fish identification training focusing on collection techniques and field identification of fish species.

# What do we do with the data?

**The Rotating Basin Program allows:**

- Comprehensive, consistent monitoring
- Assessment of stream health
- Diagnosis of potential sources of pollution
- Analysis of trends—are the streams changing for the better, worse, or not at all

# OCC's RBMP data has proven an invaluable resource for the state….

- Statewide surface water assessment (303d, integrated report)
- NPS impact assessment
- Priority watershed determination/targeting
- Determination of reference conditions necessary for effective bioassessment.

# Rotating Basin Probabilistic Monitoring Program

# What Is Probabilistic Monitoring?

- In 2008 the OCC incorporated probabilistic monitoring into the RB monitoring scheme.
- Sites are randomly selected by the EPA's Health and Environmental Effects Research Laboratory in Corvallis, Oregon.
- This type of survey provides statistically valid estimates of resource conditions with known confidence levels.

# Rotating Basin Probabilistic Monitoring Program

- 250 randomly selected sites monitored every five years across the State. 50 sites monitored each year from each basin pair
- Sites monitored for the same parameters as the fixed RB sites (water quality, biological communities and aquatic habitat)
- Randomly selected sites will allow the program to more appropriately characterize the degree of impairment and the leading causes and sources of NPS pollution to the State's waters

# Probabilistic Monitoring Results?

- Probabilistic monitoring has been completed for each of the five RB groups, and sampling is suspended while in-depth data analysis is ongoing.
- Preliminary results from the first three basins are inline with results obtained from fixed site monitoring.
- After the data from all five basins has been analyzed, OCC may reinstate probabilistic monitoring.

# Implementation Monitoring

- Pre- and post-implementation monitoring (success monitoring)
- Generally involves "automatic" water samplers
- Priority watershed projects
- NPS parameters of most concern are nutrients

# Questions?

Jason Ramming
jason.ramming@conservation.ok.gov
(405)542-3205