Validation of the Oklahoma Rapid Assessment Method (OKRAM) in Depressional and Lacustrine Fringe Wetlands

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  - ❑ Objectives/Methods
  - ❑ Results
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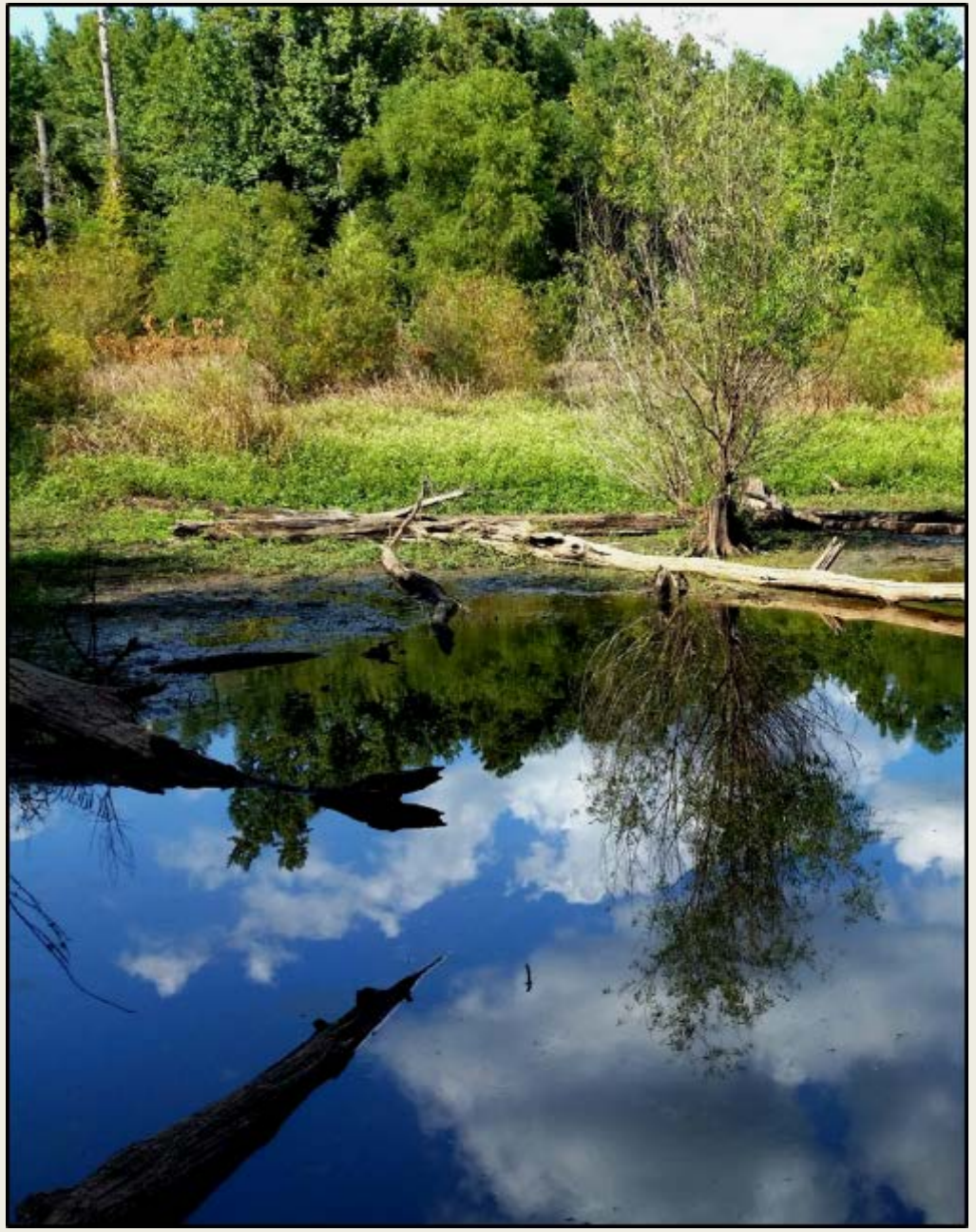
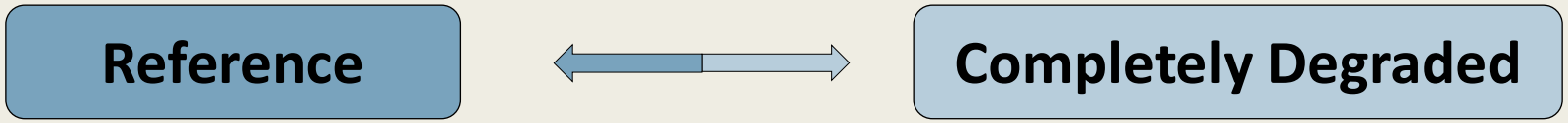


Wetland Assessments

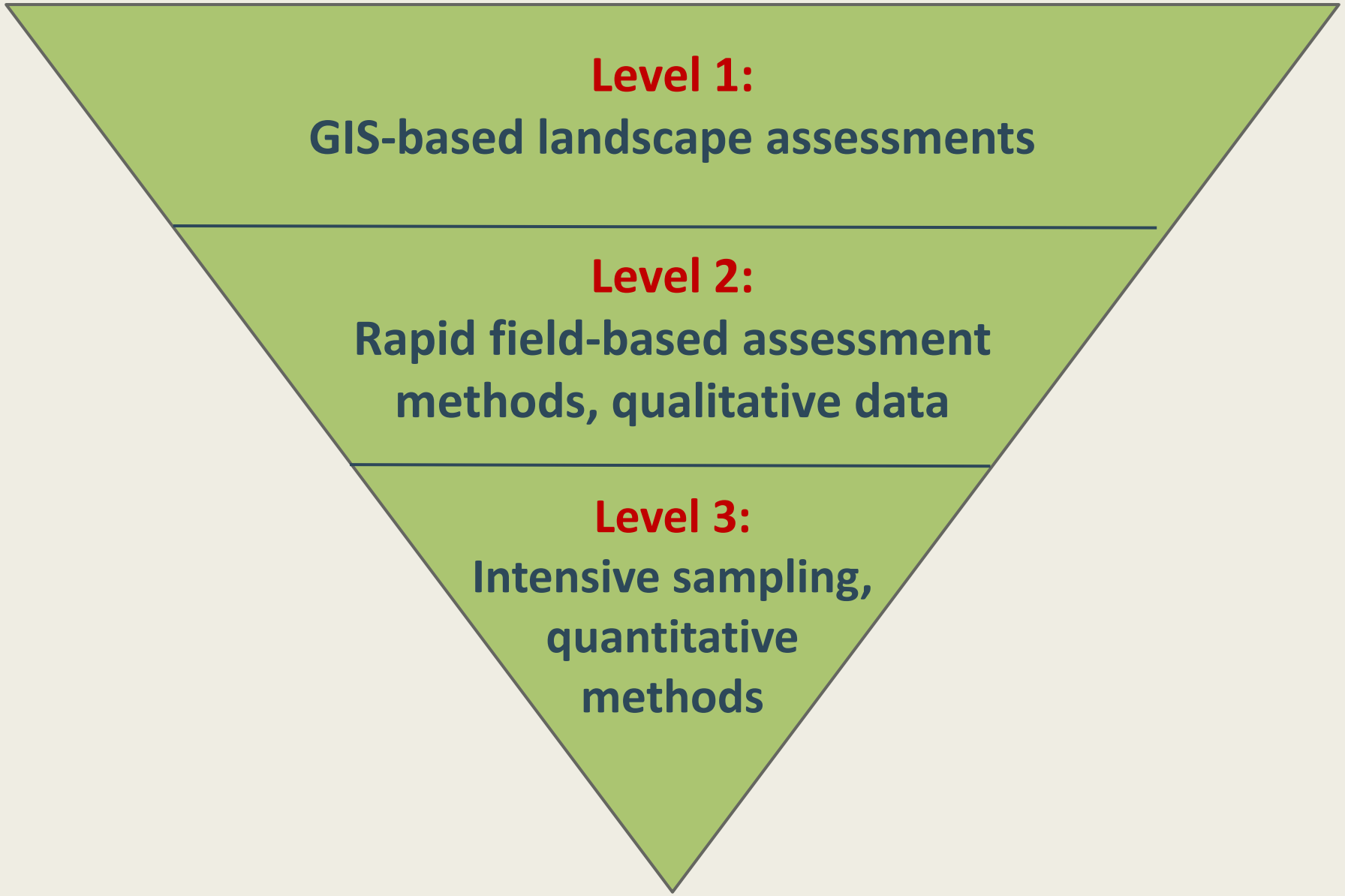
- Consistent methods to evaluate wetland condition
- Determine where a wetland lies on a disturbance gradient



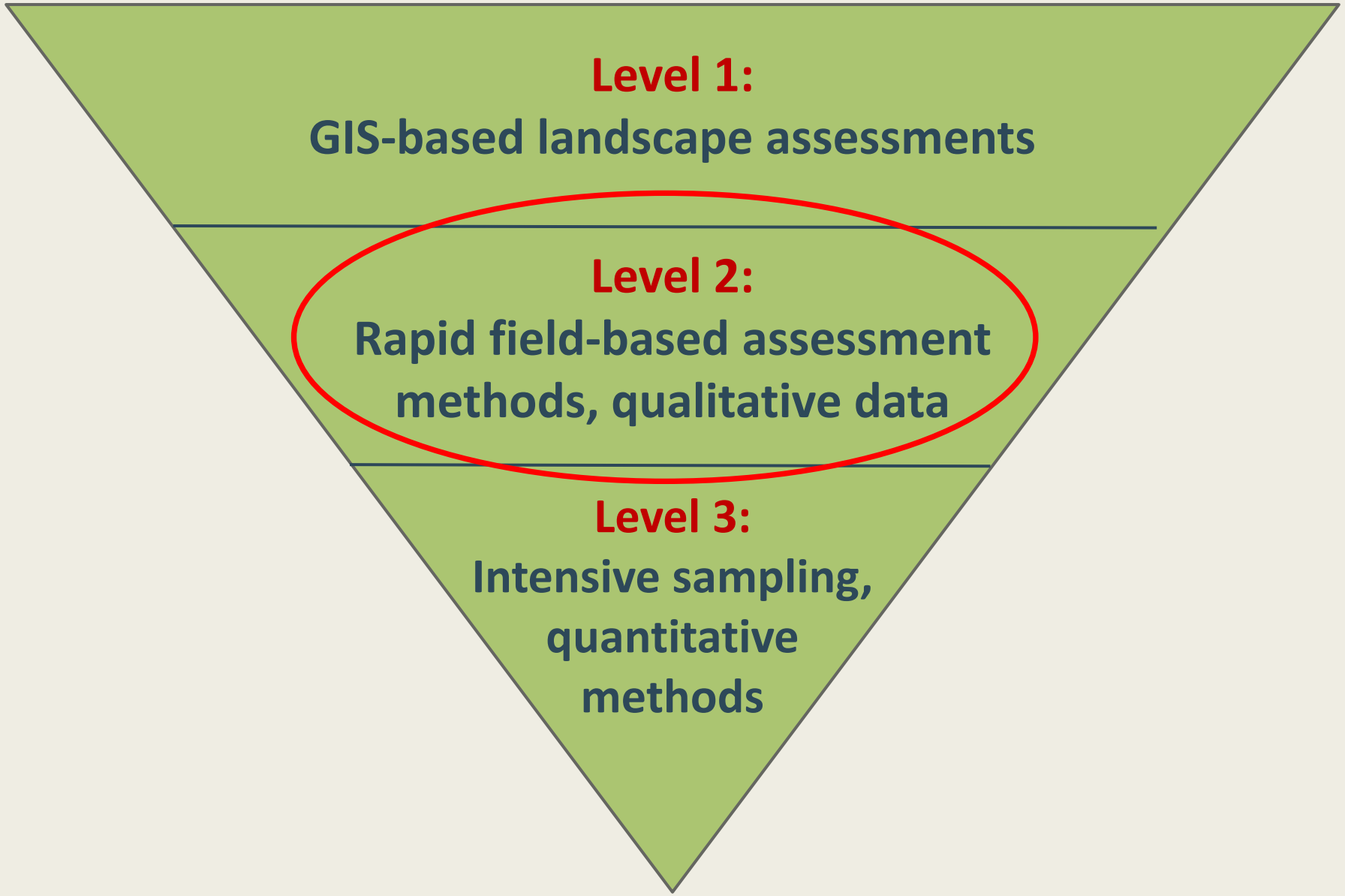
Applications:

- Tracking broad trends in wetland health
- Identifying high quality wetlands for protection
- Identifying low quality wetlands in need of restoration
- Monitoring compensatory mitigation projects

EPA's 3-Tiered framework



EPA's 3-Tiered framework



Rapid Assessment Methods (RAMs)

RAM Requirements:

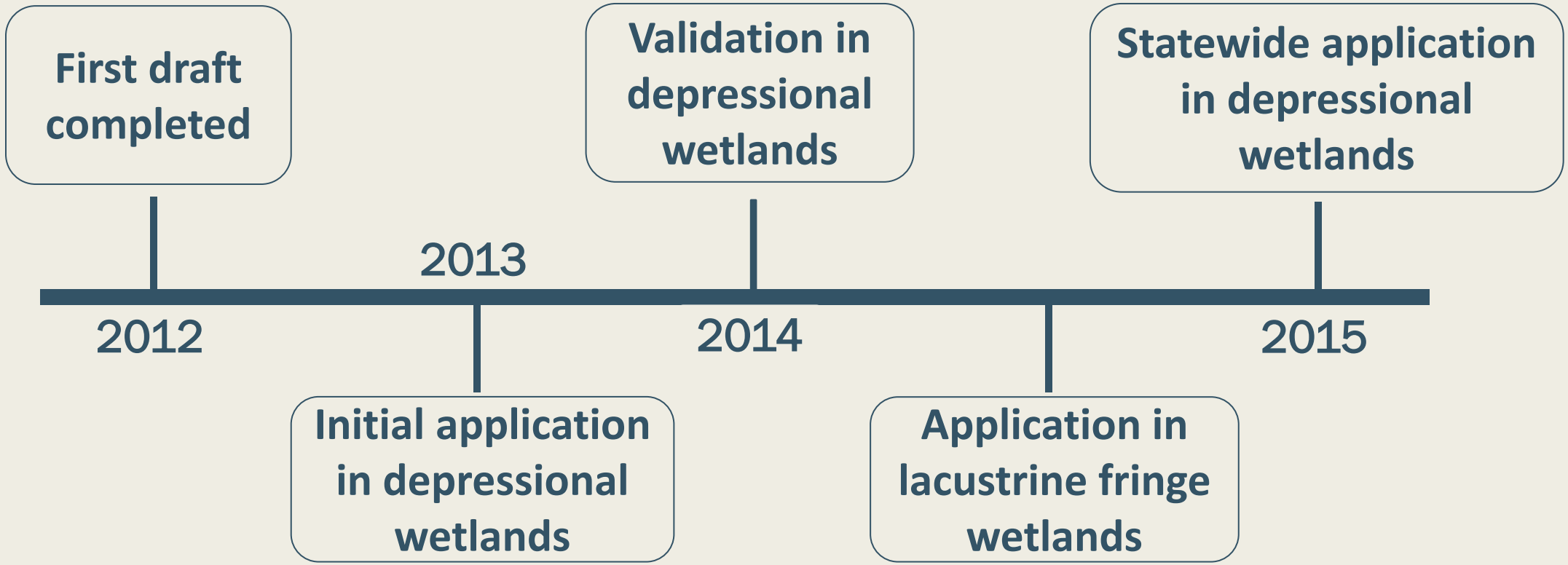
- Metrics are aggregated into a single condition score
- Rapid: 2 people, ½ day in field, ½ day in office
- On-site assessment
- Must be validated

Fennessy et al. (2007) Evaluation of Rapid Methods for Assessing the Ecological Condition of Wetlands. Wetlands 27: 543-560

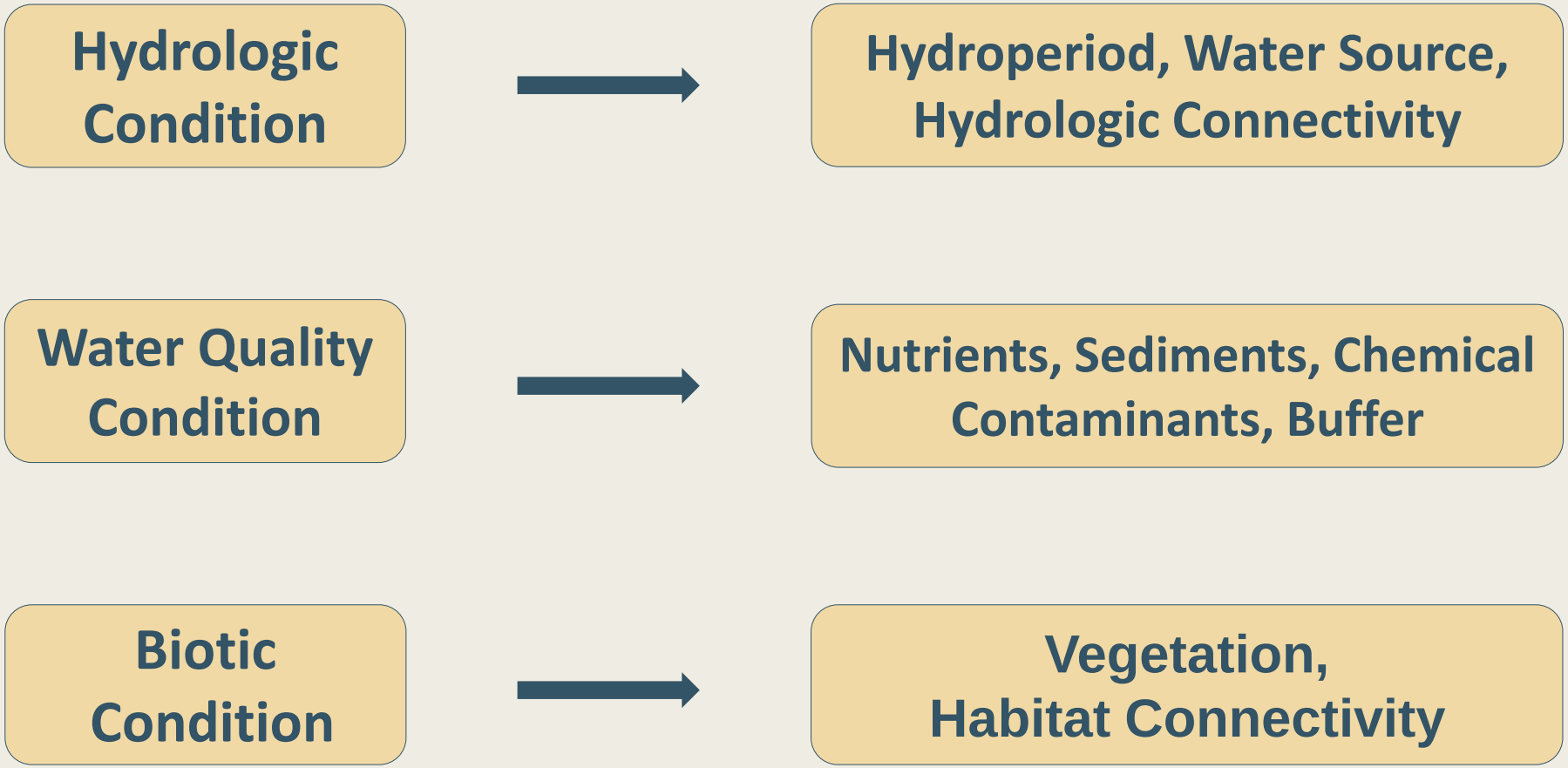
RAM Validation

- Metrics are qualitative measurements based on best professional judgment and inferred relationships
- Document relationships between a RAM and independent measures of wetland condition
  - Level 3 assessments (vegetation, invertebrates, amphibians, birds, soil/water chemistry)
  - Level 1 assessments for additional support

Oklahoma Rapid Assessment Method (OKRAM)



OKRAM Attributes and Metrics

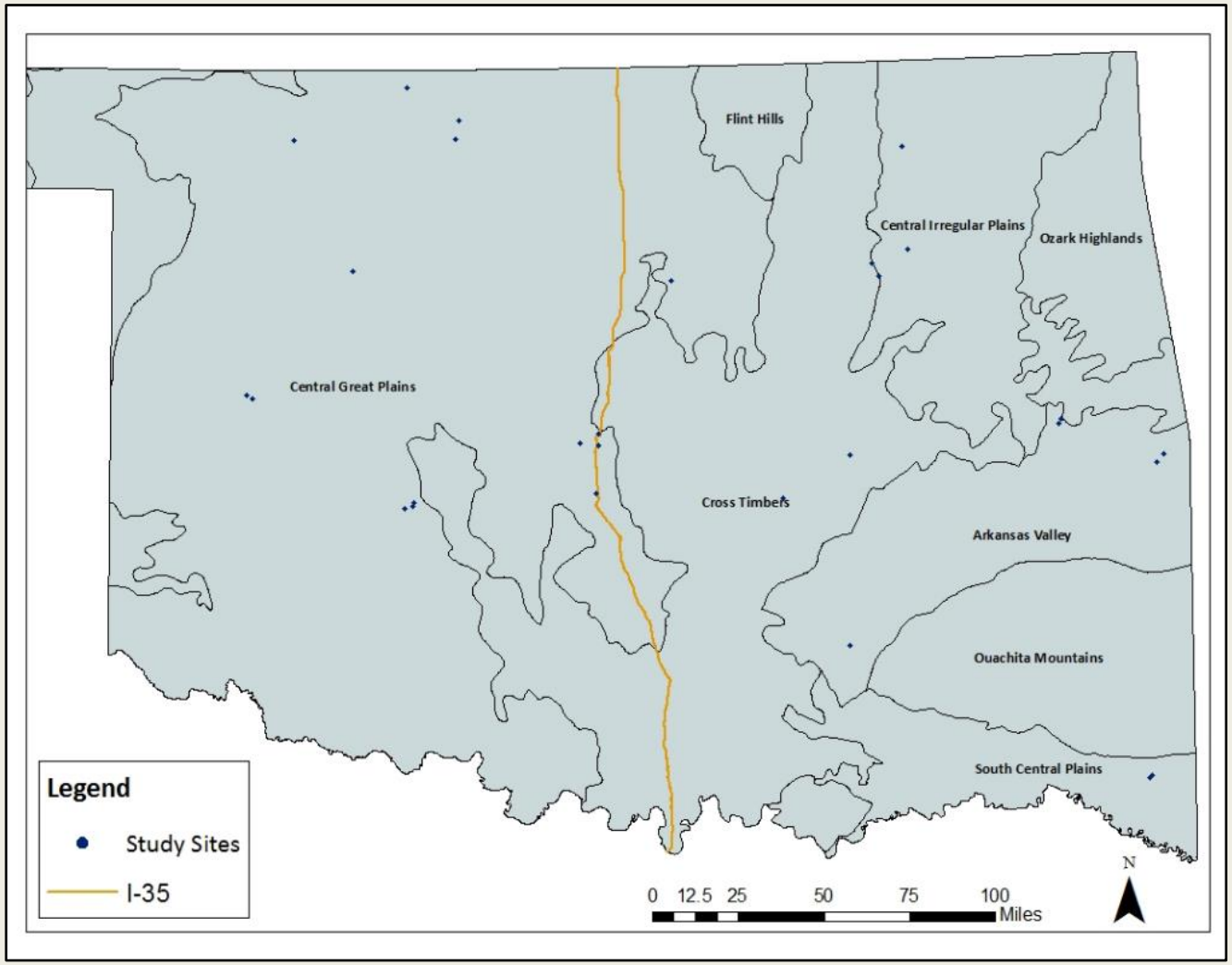


Depressional Wetlands

28 depressional wetlands

Objectives:

- Validate with Level 3 data
- OKRAM and Level 1 method
- Repeatability
- Seasonal effects



Level 1: Landscape Development Intensity (LDI)

- Based on land-use surrounding wetlands
- Assessed within 100 m, 500 m, and 1,000 m of wetlands

Land-Use Types	LDI Coefficient
Natural System	1.00
Open Water	1.00
Pasture/Hay	2.77
Developed, Open Space	6.92
Agriculture	7.00
Developed, Low Intensity	7.55
Barren Land	8.32
Developed, Med. Intensity	9.42
Developed, High Intensity	10.00

(Brown & Vivas 2005; Mack 2006)

Level 2: RAMs

RAM Application

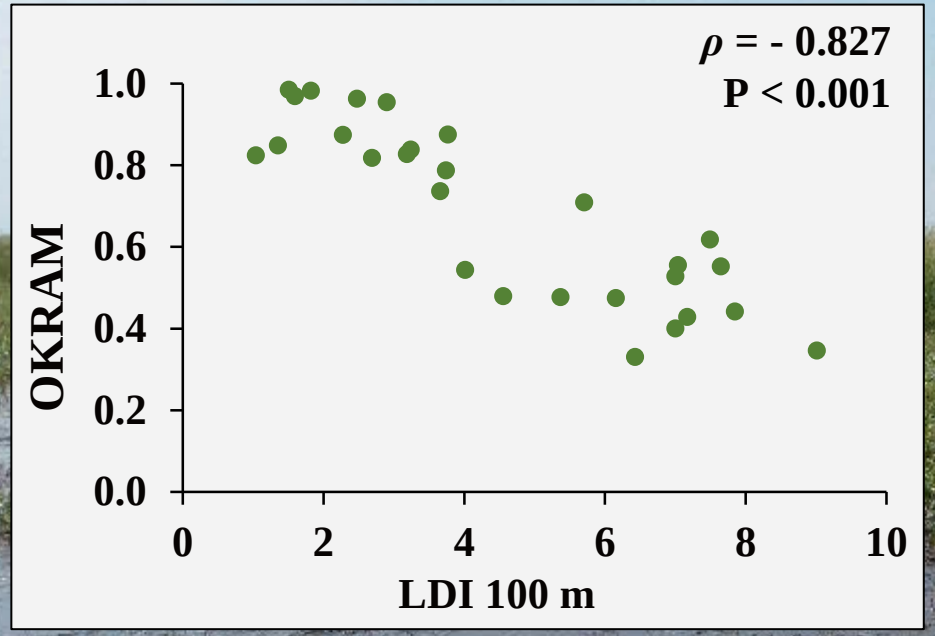
- Summer assessment: OKRAM, CRAM, and FACWet methods
- Spring assessment: OKRAM reapplied in 10 wetlands

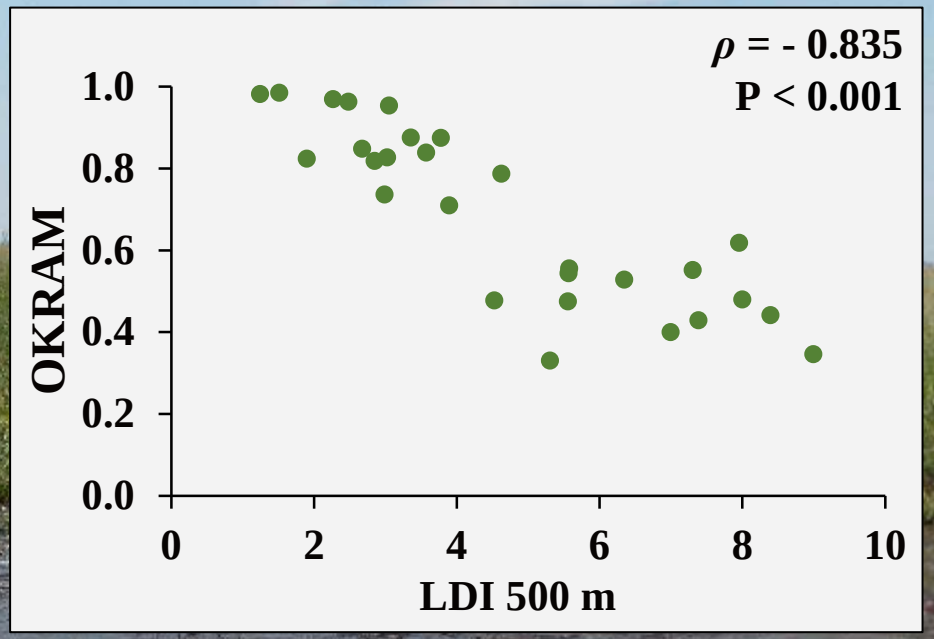
Level 3: Intensive data collection

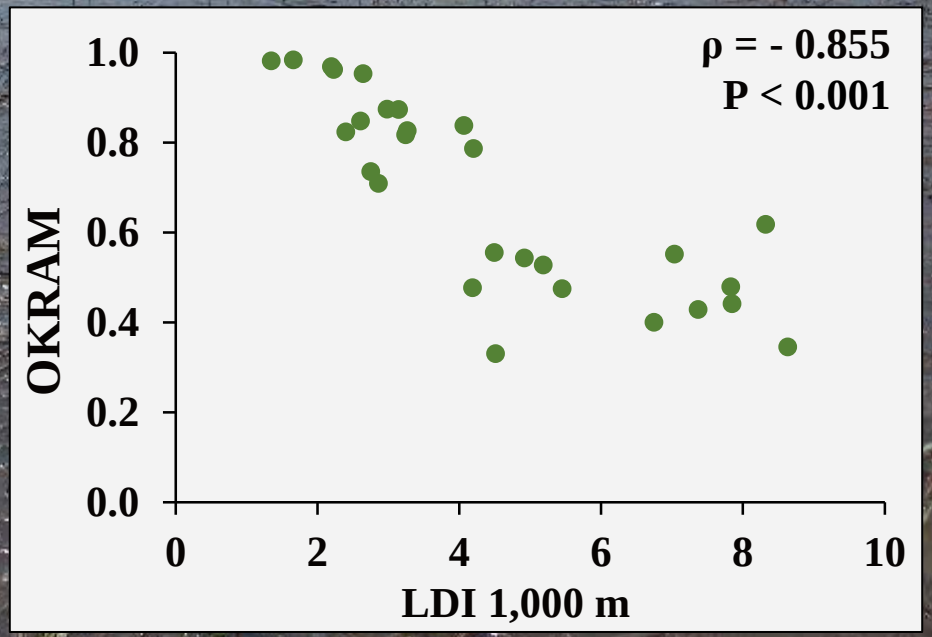
Validation data:

- Vegetation
- Soil chemistry
- Invertebrates
- Water quality

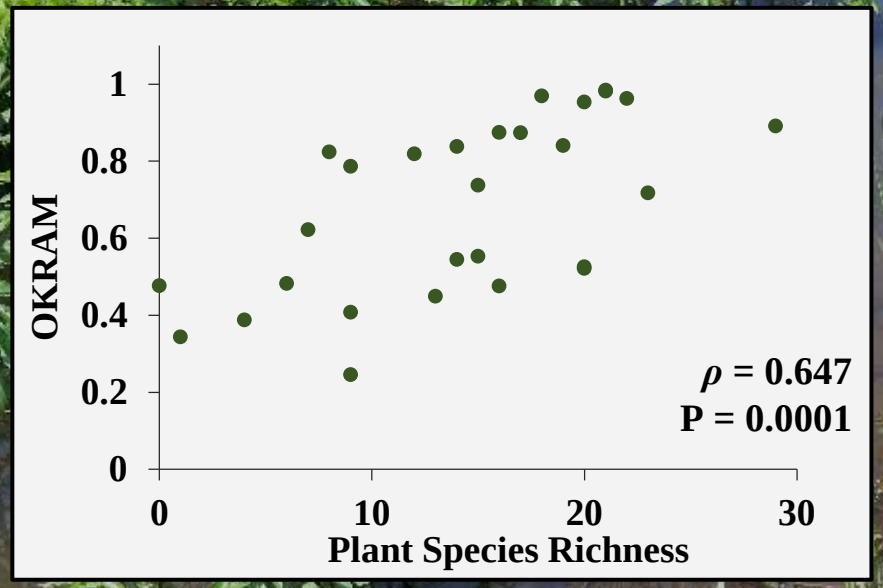
OKRAM Relationships with LDI

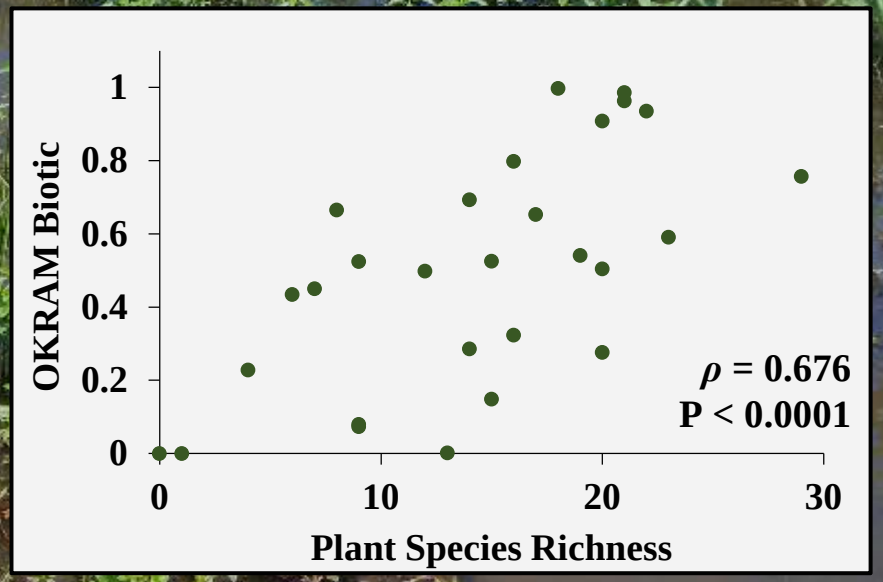


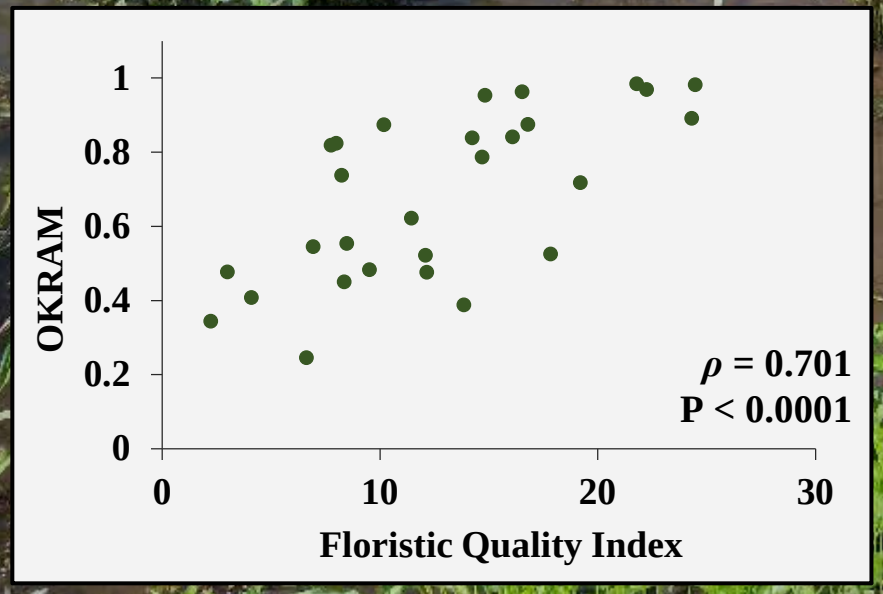


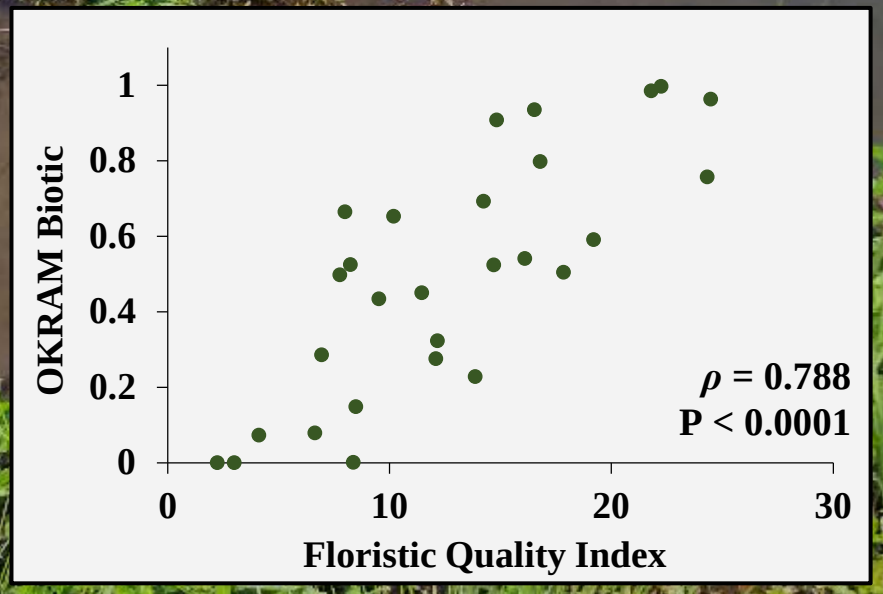


OKRAM Relationships with Level 3









OKRAM Repeatability

Metric	Avg. Evaluator Difference (%)
Hydroperiod	1.2
Water Source	8.4
Hydrologic Connectivity	3.0
A1: Hydrologic Condition	4.0
Nutrients	1.6
Sediment	2.3
Chemical Contaminants	1.2
Buffer Filter	2.0
A2: Water Quality	1.4
Vegetation	3.1
Habitat Connectivity	4.2
A3: Biotic Condition	3.9
Overall OKRAM	1.9

OKRAM Seasonality Analysis

Metric	Avg. Seasonal Difference (%)
Hydroperiod	0.5
Water Source	3.6
Hydrologic Connectivity	0.0
A1: Hydrologic Condition	1.5
Nutrients	1.5
Sediment	1.8
Chemical Contaminants	2.0
Buffer Filter	0.9
A2: Water Quality	1.4
Vegetation	12.8
Habitat Connectivity	1.5
A3: Biotic Condition	7.9
Overall OKRAM	2.4

OKRAM in Depressional Wetlands

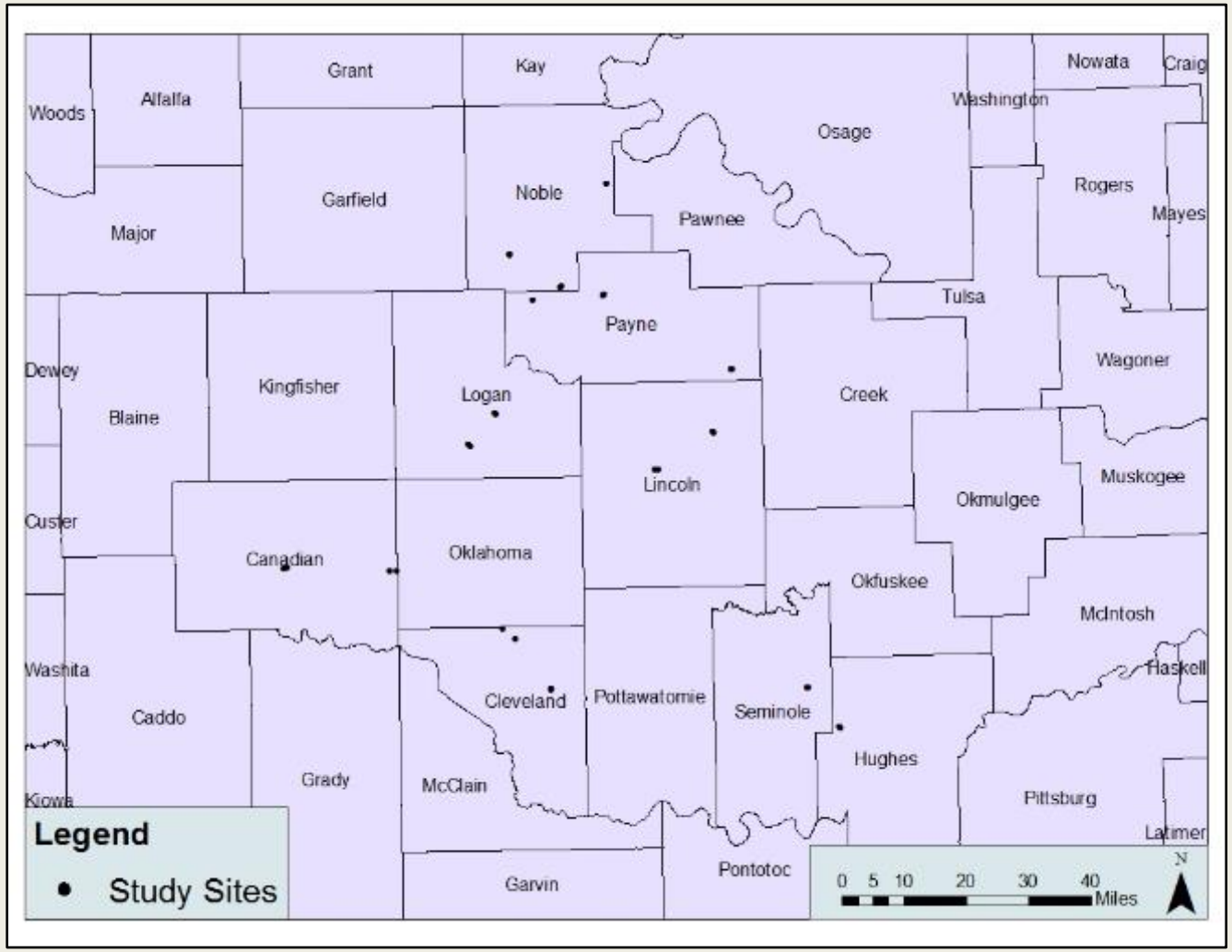
- Validated with Level 1 and Level 3 assessments
- All metrics are repeatable
- OKRAM can be applied regardless of time of year

Lacustrine Fringe Wetlands

30 lacustrine fringe wetlands in Central Oklahoma

Objectives:

- Validate with Level 3 data
- OKRAM and Level 1 method



Methods: Lacustrine Fringe Wetlands

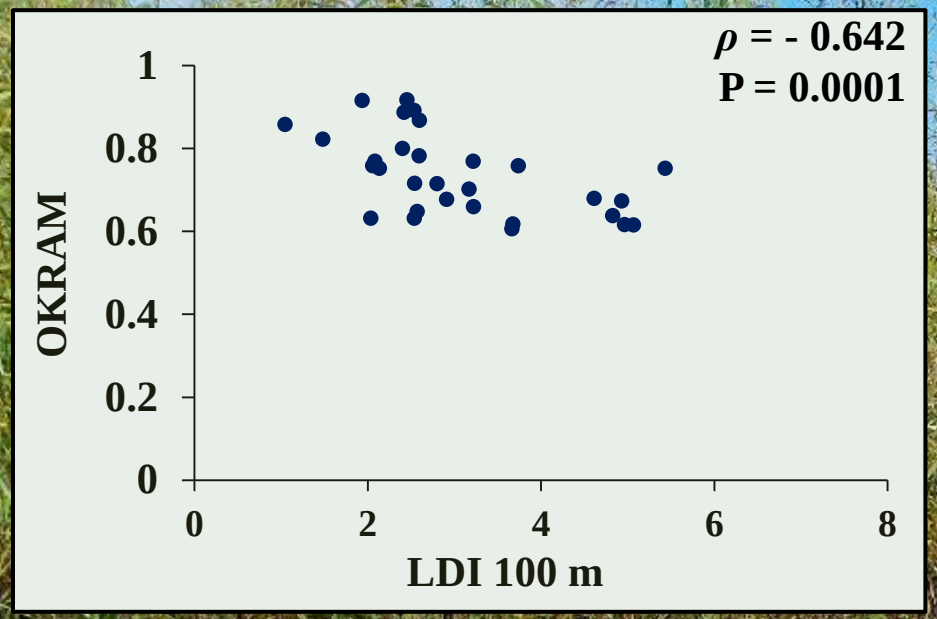
Level 1: LDI

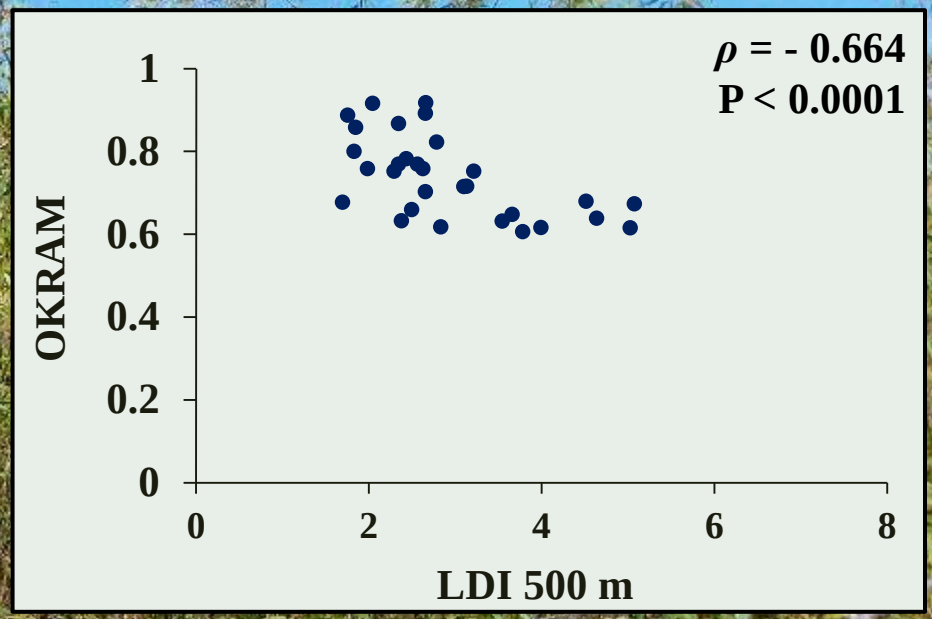
Level 2: RAM Application

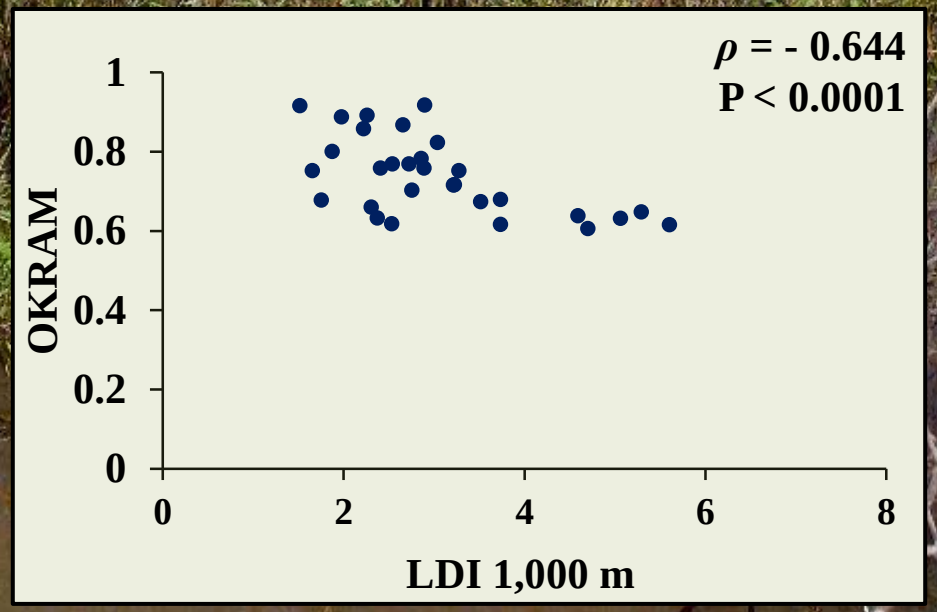
- Summer assessment: OKRAM, CRAM, and FACWet methods
- Spring assessment: OKRAM reapplied in 10 wetlands

Level 3: Vegetation, soil, invertebrates, water quality

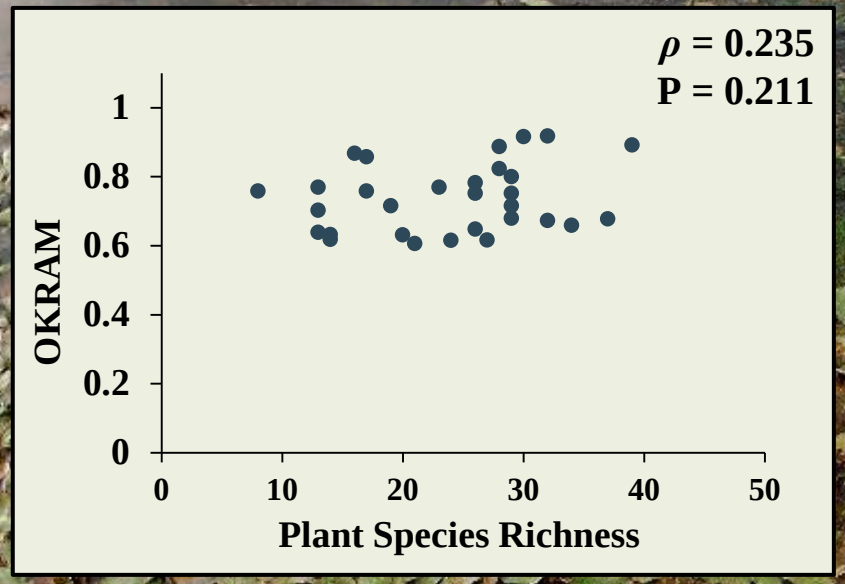
OKRAM Relationships with LDI

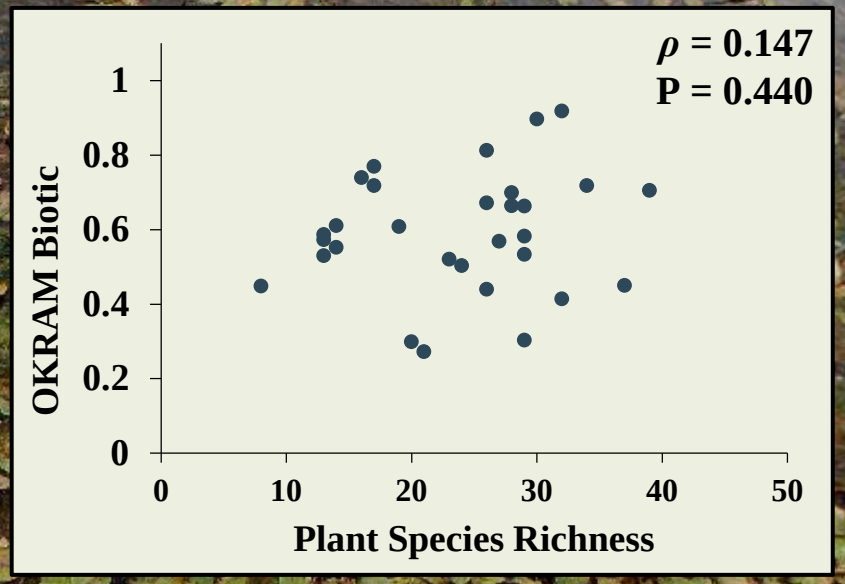


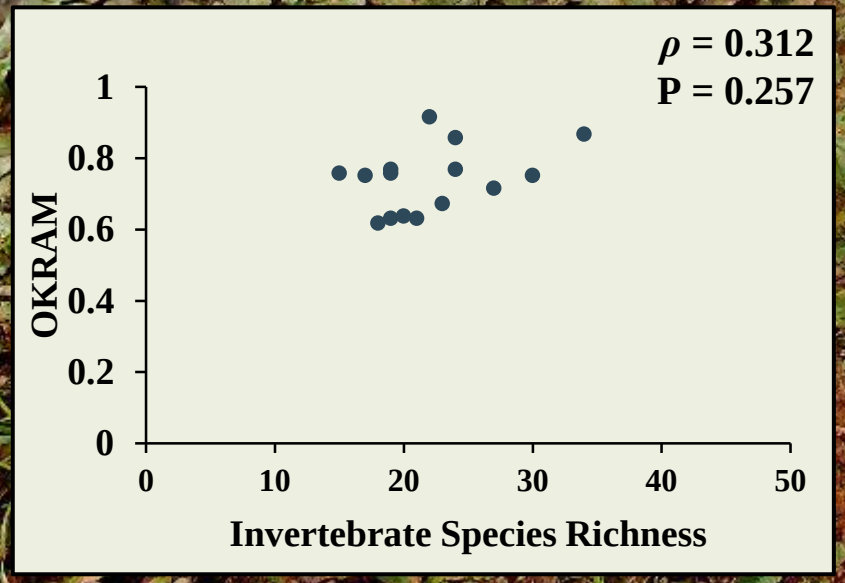


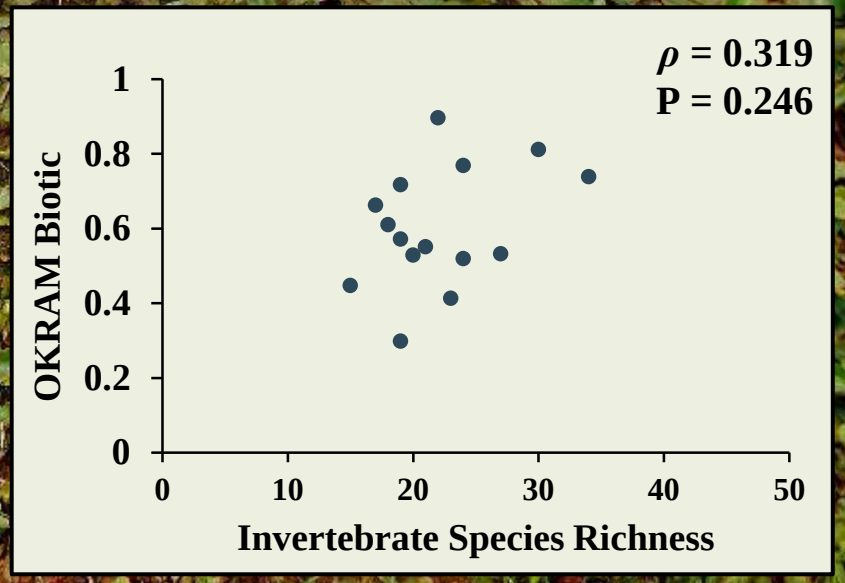


OKRAM Relationships with Level 3 Data









Reservoir hydrology

- Man-made and highly regulated
- Stable water levels
  - Lower species richness
  - Lower diversity
  - Monocultures
- Extreme water level fluctuations
  - Stressed plant communities

Site Selection

- Narrow OKRAM score range
  - Site selection did not capture entire disturbance gradient
- Evaluate the existing range of conditions
  - Do high quality, reference sites exist?
  - Do extremely degraded sites exist?

Future Needs

Depressional wetlands

- ❑ Validation with a larger sample size
- ❑ Repeatability with more evaluators
- ❑ Develop a guidebook

Lacustrine fringe wetlands

- ❑ Modification of metrics
- ❑ Further validation

Riverine wetlands

- ❑ Initial application/calibration
- ❑ Validation statewide

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Questions?