APPALACHIAN
LANDSCAPE CONSERVATION COOPERATIVE

CONSERVATION PLANNING/DESIGN PHASE II AQUATIC METRICS: SOUTH

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BALDWIN
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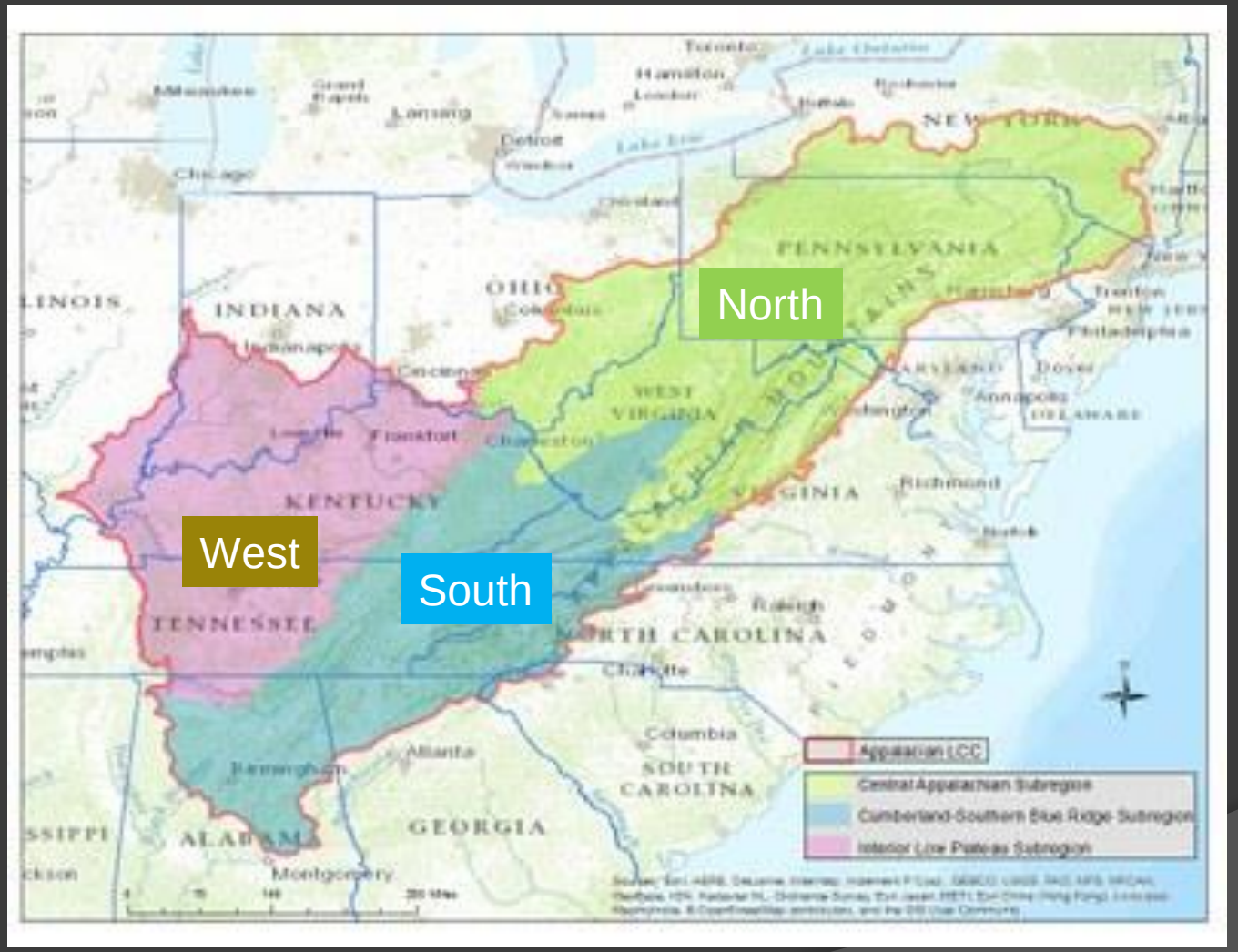
UNIVERSITY

App LCC Subregions



Webinar Outline

- Review proposed aquatic metrics for LCD
- Assign scales of assessment to metrics
- Present process for setting thresholds
- Present preliminary thresholds

Round Robin Questions

- Can any of the proposed metrics be combined or dropped?
- What is the scale of assessment for each metric?
- Does the development of thresholds seem like a good process?

Aquatic Ecosystem Integrity Assessment Factors

- Flow Regime
- Physical Habitat
- Water Quality
- Connectivity
- Energy Supply
- Species Interactions

Aquatic Ecosystem Integrity
Types of Assessment Factors

- Habitat Suitability
  - e.g., flow regime, substrate, connectivity, etc.
- Biological Conditions
  - e.g., MI IBI, Fish IBI, etc.
- Indicators of Stress
  - e.g., N, P, sediment, riparian disturbance, etc.
- Sources of Stress
  - e.g., # of dams, % impervious surface, etc.

Review Preliminary Aquatic Metrics

See Table 1 that was provided prior to this consultation.

Proposed Aquatic Assessment Metrics

Attribute	Metric
Flow Regime	Flow Alteration from Storage (total storage/mean annual flow)
	Density and type of large dams
	Agricultural water withdrawal
	Industrial water withdrawal
Connectivity	Functional Network Size (total length of free-flowing conditions around the assessment reach)
	Density of small dams: Upstream
	Density of small dams: Downstream
	Density of crossings: Upstream
	Density of crossings: Downstream
	Road Length Density
Water Quality (Pollutants)	Anthropogenic N Yield
	Anthropogenic P Yield
	Anthropogenic Sediment Yield
	Conductivity

Attribute	Metric
Water Quality (Land Use)	% Impervious Surface
	% Natural Cover
	% Low intensity urban land use
	% Medium intensity urban land use
	% High intensity urban land use
	% Crop
	% Pasture/Hay
Water Quality (Point Source)	Superfund site density (# per watershed area)
	NPDES site density (# per watershed area)
	Toxic release inventory site density (# per watershed area)
	Coal mine density (# per watershed area)
Physical Habitat	Wetland Loss

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Physical Habitat	Wetland Loss

Phase II Target
Spatial Scale of Assessment

- Network
  - Catchment (NC)
  - Buffer/ Active River Area (NB)
- Local
  - Catchment (LC)
  - Buffer/ Active River Area (LB)

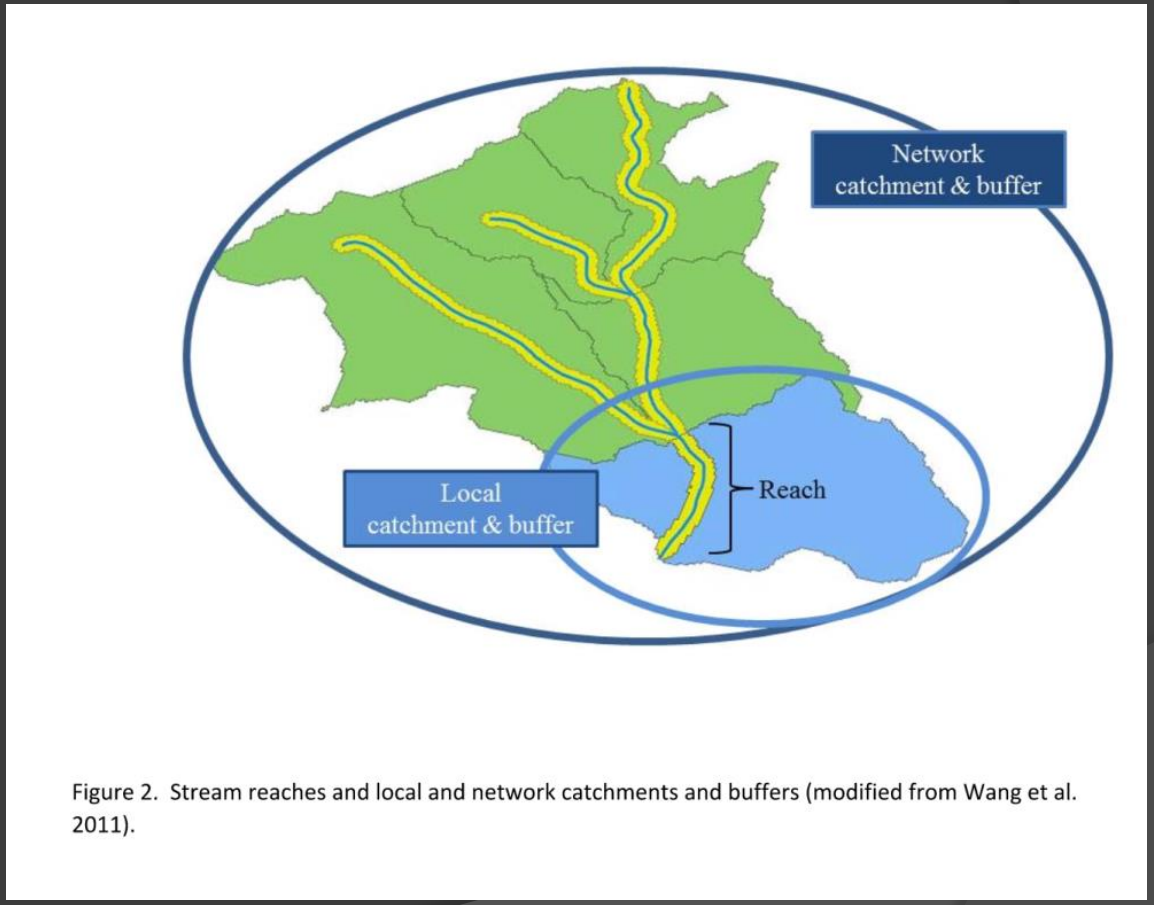

Figure 2. Stream reaches and local and network catchments and buffers (modified from Wang et al. 2011).

Round Robin Questions

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Proposed Aquatic Assessment Metrics: SCALE

Attribute	Metric	Scale (LC,NC,LB,NB)
Flow Regime	Flow Alteration from Storage (total storage/mean annual flow)	NC
	Density and type of large dams	NC
	Agricultural water withdrawal	NC
	Industrial water withdrawal	NC
Connectivity	Functional Network Size (total length of free-flowing conditions around the assessment reach)	
	Density of small dams: Upstream	
	Density of small dams: Downstream	
	Density of crossings: Upstream	
	Density of crossings: Downstream	
	Road Length Density	
Water Quality (Pollutants)	Anthropogenic N Yield	
	Anthropogenic P Yield	
	Anthropogenic Sediment Yield	
	Conductivity	

Attribute	Metric	Scale (LC,NC,LB,NB)
Water Quality (Land Use)	% Impervious Surface	
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Physical Habitat	Wetland Loss	

AppLCC basic map - ArcMap

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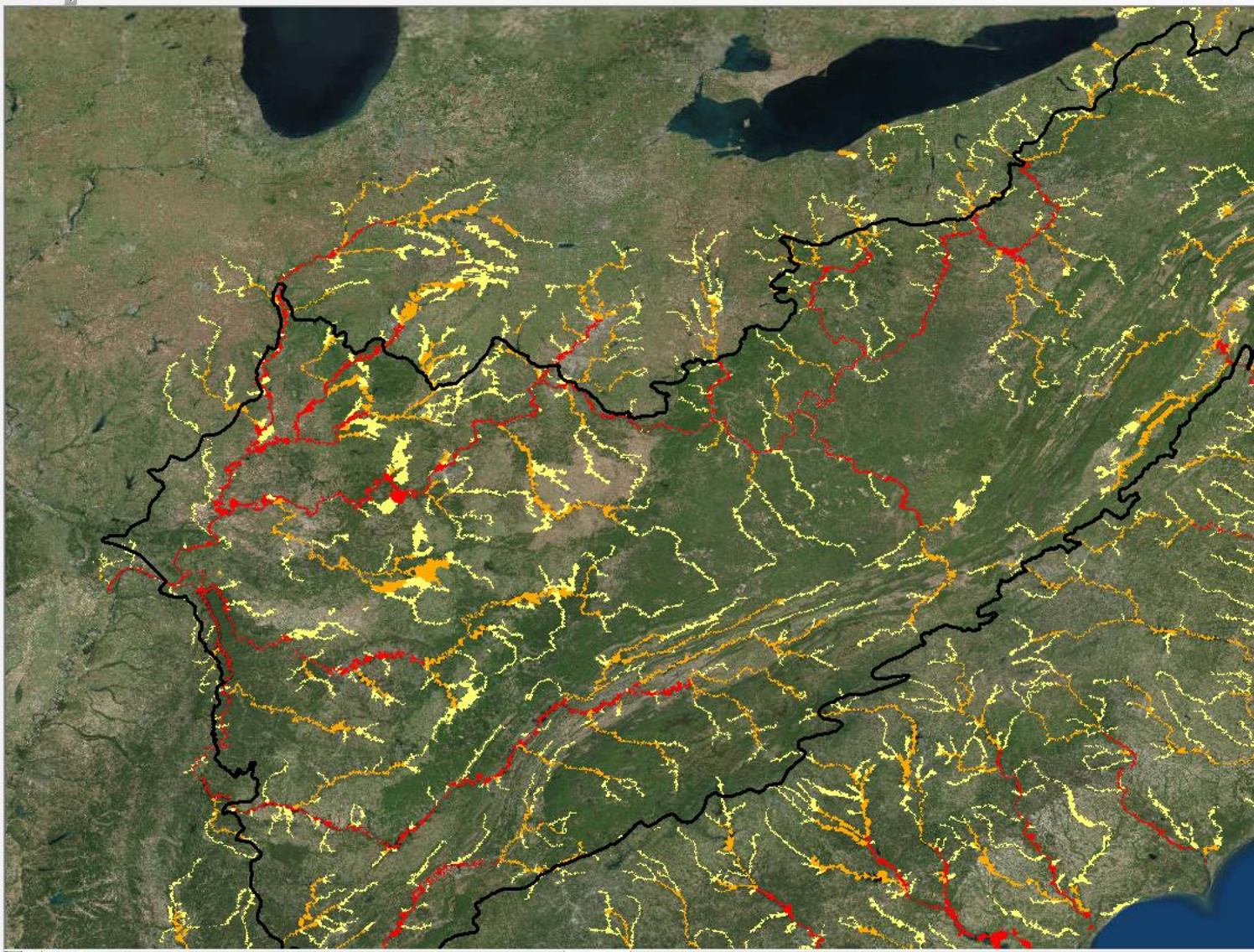

Process for Setting Aquatic Assessment Thresholds

1. Set preliminary “common-sense” thresholds for each metric
   - Characterize condition of streams and rivers
   - Assign preliminary values to each stream segment for
     - Undisturbed,
     - Low,
     - Medium, and
     - High Impact Levels
   - Obtain expert review of mapped results

2. Validate “common-sense” thresholds with ecological responses for each metric
   - Obtain biotic data for ecological responses
   - Determine significance of relationships between ecological response and assessment condition
   - Develop thresholds for significant metrics based on regression curve and “common sense”
   - Eliminate assessment metrics with non-significant and non-mechanistic relationships

Round Robin Questions

- Can any of the proposed metrics be combined or dropped?
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Review Preliminary Aquatic Metric Thresholds

See Table 2 that was provided prior to this consultation.

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Schedule of LCD Phase II Aquatic Consultations

- ✓ April 7 - Intro to LCD Phase II Framework and Metrics
- ✓ April 19 - Aquatic Metrics, Models, and Regional Data (North)
- ✓ April 20 –Metrics, Models, and Data (South)
- ✓ April 21 –Metrics, Models, and Data (West)
- ◉ May 10 - Ecosystem Condition Metrics Scale and Thresholds (North)
- ◉ May 11 – Metric Scale and Thresholds (South)
- ◉ May 12 - Metric Scale and Thresholds (West)
- ◉ May 26 - Final review of Framework, Metrics, Thresholds (allow 2 hours)