

# Aquatic Life Use Flexibilities: Other State Experiences

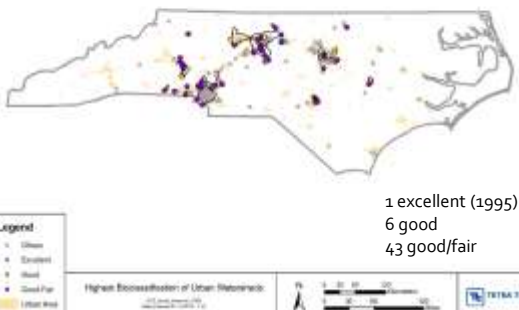
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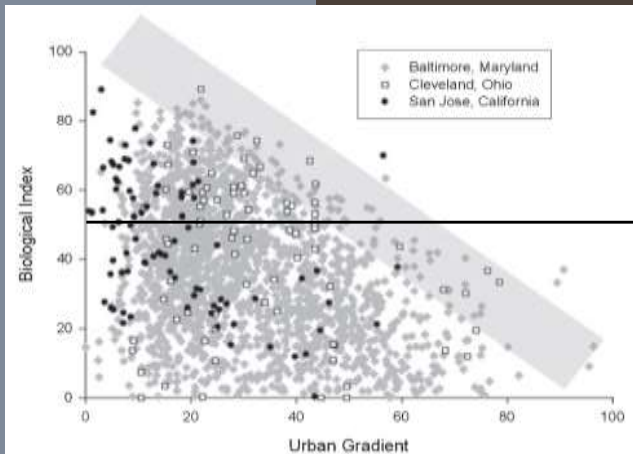
## Urbanization constrains biological potential

50 of 334 sites were good-fair or better at some time



- Few good aquatic life use sites in NC (11%)
- Of the good-fair or better scores, many are old
- No urban sites improved through time, but 37 declined

## Urbanization constrains biological potential



Plot of macroinvertebrate index response to an urban gradient in 3 biomes across the US. From Paul et al. 2009.

### North Carolina is not alone

- Urban streams are biologically impacted
- But biological conditions vary, even at high urbanization levels
- They rarely attain a single aquatic life use targets
- Is that a fair or even useful construct?
- What have other states done in similar situations?

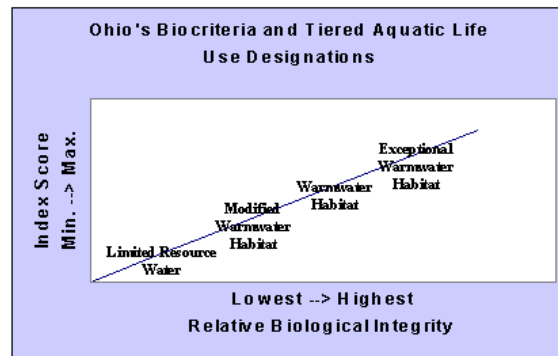
## Goal

- Describe approaches used in other states to address aquatic life use expectations in compromised landscapes
  - Regulatory basis
  - Tiered Aquatic Life Uses
  - Biological Condition Gradient

## 40 CFR 131.10 (g)

- Use Attainability language
- States may establish sub-categories of a use (e.g., aquatic life) if the state can demonstrate that attaining the use is infeasible because...
  - (3) human caused conditions or sources prevent attainment and cannot be remedied without causing more damage;
  - (4) hydrologic modifications preclude attainment and it is not possible to restore;
  - (6) controls more stringent than those in sections 301(b) and 306 would result in widespread economic and social impact

## Tiered Uses



Not all waters are created equal, nor do they have the same expectation

A horrible  
metaphor for  
any who may  
be horribly lost



- Manchester United – currently in 6<sup>th</sup> place in the Premiership

A horrible  
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English League One



Lucas Akins

- How many of you know of Burton Albion?



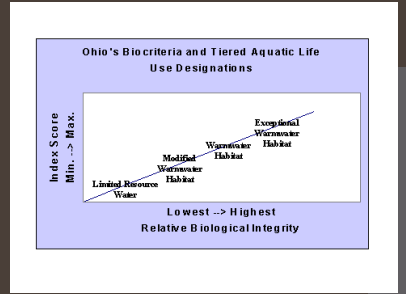
A horrible metaphor for any who may be horribly lost

Premiership	Championship	League One	League Two
Leicester	Burnley	Burton Albion	Northampton
Tottenham	Brighton	Wigan	Oxford United
Arsenal	Middlesbrough	Walsall	Plymouth
Man City	Hull	Gillingham	Bristol Rovers
West Ham	Derby	Millwall	Accrington
Man United	Sheffield Wednesday	Bradford	Portsmouth
Southampton	Cardiff	Coventry	Leyton Orient
Liverpool	Ipswich	Barnsley	Wycombe
Stoke	Birmingham	Port Vale	Wimbledon
Chelsea	Preston	Southend	Carlisle
West Bromwich	Queens Park Rangers	Sheffield United	Mansfield
Everton	Wolverhampton	Rochdale	Cambridge
Bournemouth	Leeds	Scunthorpe	Luton
Watford	Nottm Forest	Swindon	Exeter
Crystal Palace	Reading	Bury	Barnet
Swansea	Blackburn	Peterborough	Crawley
Sunderland	Brentford	Shrewsbury	Newport
Norwich	Huddersfield	Chesterfield	Morecambe
Newcastle	Bristol	Fleetwood	Notts County
Aston Villa	Fulham	Doncaster	Yeovil
	Milton Keynes Dons	Oldham	Hartlepool
	Rotherham	Blackpool	Stevenage
	Charlton	Crewe	York
	Bolton	Colchester	Dag & Reed

Tiered Uses are not Soccer

- Tiered uses set different performance expectations
- Sites that meet their performance expectation are okay
- Sites that exceed their performance expectations are promoted
- Sites that do not meet their performance expectations are not demoted; not easily

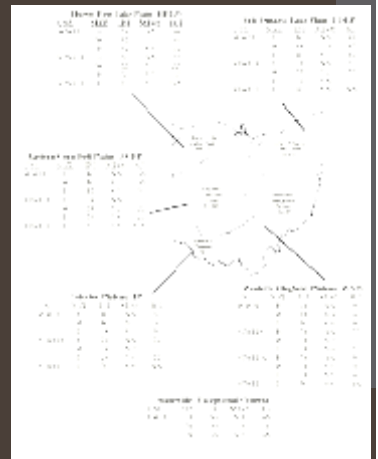
# Ohio



- Have had tiered uses for some time
- Modified warmwaters
  - "irretrievable modifications of the physical habitat."

# Ohio

- Example: Eastern Corn Belt Plains
- Invertebrate Community Index
  - Modified Warmwater Habitat : Channel Modification (22)
  - Warmwater Habitat (36)
  - Exceptional Warmwater Habitat (46)



# Maine

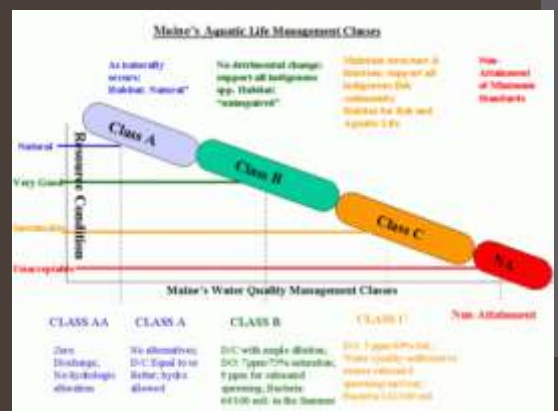
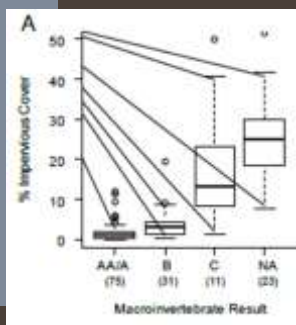
- Maine's Aquatic Life Use Classes
  - AA – No direct discharge; aquatic life as naturally occurs
  - A – natural habitat; aquatic life as naturally occurs
  - B – Unimpaired habitat...without detrimental changes in the resident biological community
  - C – Habitat for aquatic life...some changes to aquatic life



Sabattus River from Sabattus Lake to limits of the Lisbon urban area - Class C

# Maine

- Previously – “no harm to biota”
  - Did not credit pollutant abatement efforts
  - Did not acknowledge constraints on biological integrity
  - Must support indigenous fishes, but some impacts to biota allowed
  - Must meet all chemical criteria



## Florida

- Class III Limited – Maintenance of a limited population of fish and wildlife
  - Same criteria as Class III waters except site specific alternative criteria
  - Restricted to: nutrients (including nutrient response variables), bacteria, dissolved oxygen, alkalinity, specific conductance, transparency, turbidity, biological integrity, or pH

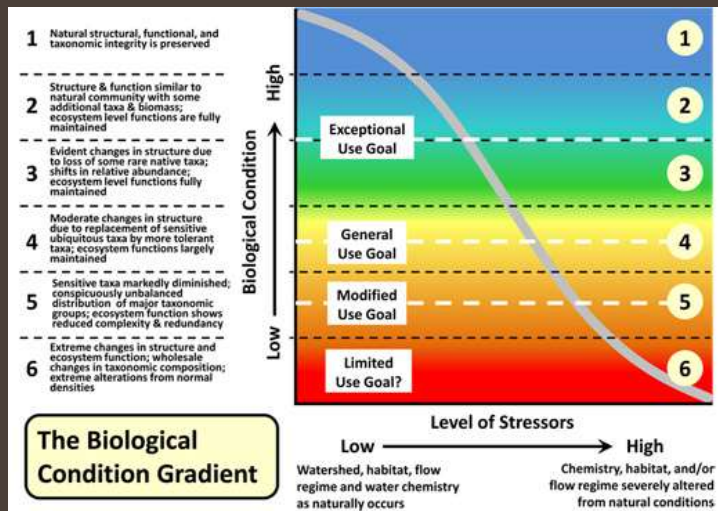


## Constructing Tiered Use Tools

- Ohio – developed different points along an Index
- Maine – trained a discriminant analysis model
- Florida – has not defined a method; site specific application
- Biological Condition Gradient Models



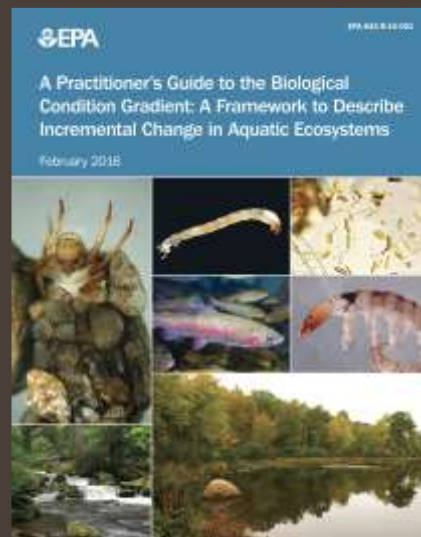
## Biological Condition Gradient



Minnesota PCA

## Biological Condition Gradient

- Hot of the presses
- EPA guidance on BCG
- Detailed method for deriving tools to define tiers
- Scientifically defensible
- Heavily vetted and practiced
- Requires a sound bioassessment program

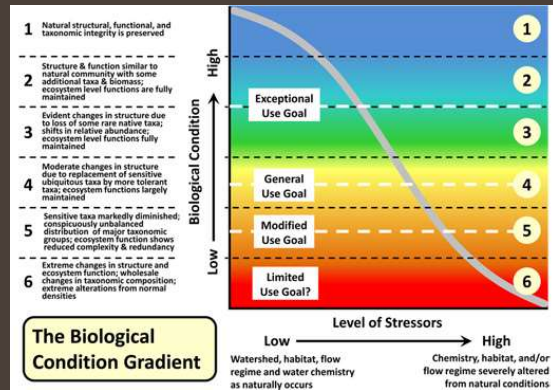
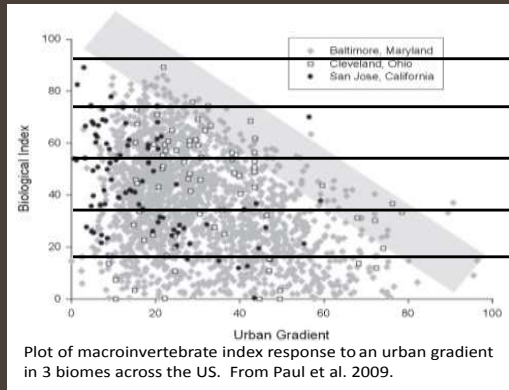


## Biological Condition Gradient Tools



## Goal

- Describe approaches used in other states to address aquatic life use expectations in compromised landscapes
  - Regulatory basis – 131.10 (g)
  - Tiered Aquatic Life Uses – Several State Examples
  - Biological Condition Gradient – 16+ states and counting



## Let's Discuss

### Discussion 1 – How bad is the problem?

- Are we seeing variability among aquatic life uses in urban areas? Or is the urban stream syndrome universal in your experience?
  - Share examples of the extent of biological impacts in urban areas
  - Share examples of some better than expected biological conditions in urban areas
- What are the characteristics of the worst and the potentially best amongst what you have?
  - Are there specific landscape features associated with this range?
  - What factors do you think play a role in better or worse than average aquatic life conditions in urban areas?

## Let's Discuss

Discussion 2 – What are the range of practice solutions being implemented?

- Are we gaining ground through interventions?
  - Share examples of some of the interventions you have used or seen?
  - Which have succeeded and which failed?
  - What is success?

## Let's Discuss

Discussion 3 – What policy solutions exist?

- What flexibilities exist?
  - Share examples of some policy/regulatory solutions/effort that you know of
  - Which seem to be working; which do not
- What are the advantages and disadvantages of tiered uses?