

Communicating the Challenges of Urban Streams Through Better Biological Assessments



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Virginia's changing view on Urban Streams

- Urban Streams Workgroup
 - Focus on biological impairments
- Urban Stream Aquatic Life Use impairments
 - ~75% benthic
- MS4 Feedback:
 - Benthic TMDLs have a high bar for success
 - Huge cost for little gains
 - Public doubt/skepticism



Urban Stream Syndrome

- Urban Stream Syndrome: flashier flows, elevated concentrations of contaminants, altered channel morphology, and reduced biotic richness with increased dominance of tolerant species. (Walsh et al., 2005)
 - That is a lot of stress
 - Biological assessments will support USS diagnosis but that's it

Stream Functions Pyramid

A Guide for Assessing & Restoring Stream Functions » OVERVIEW

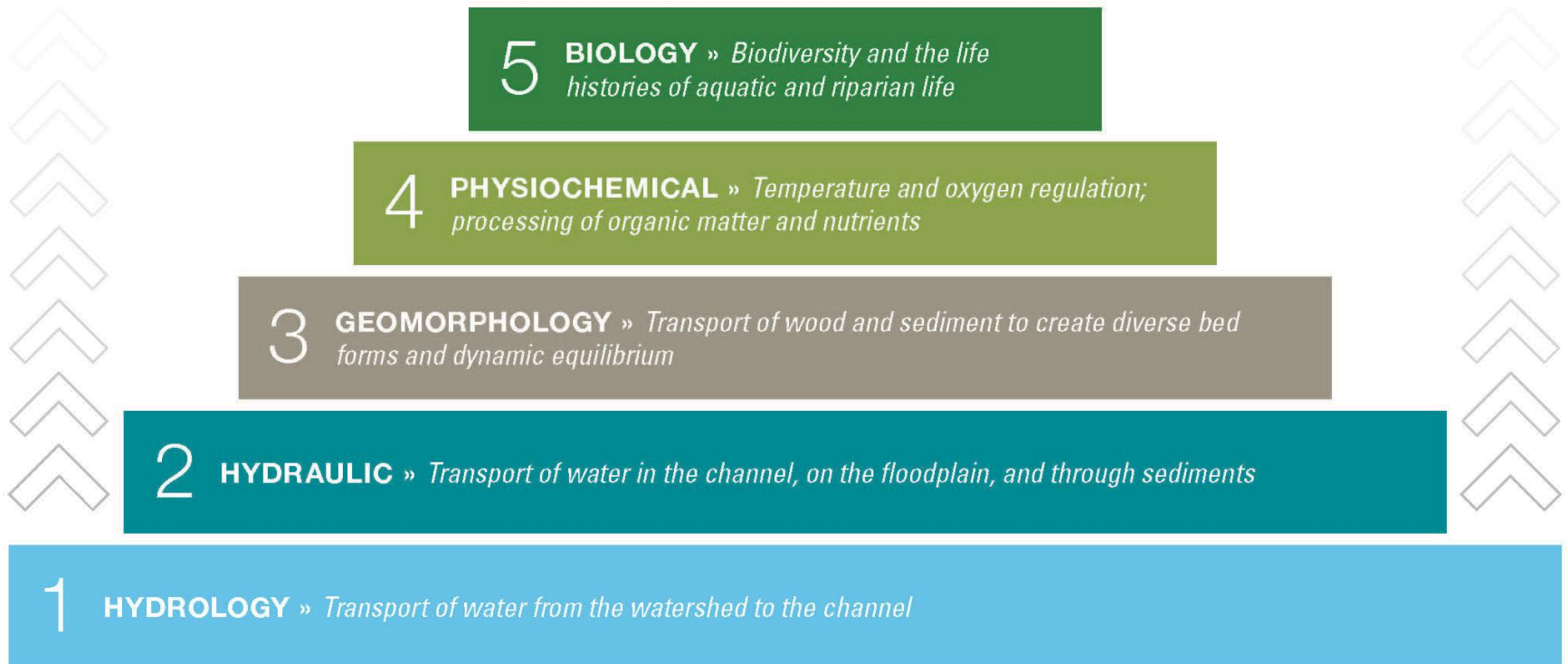


FIGURE 1

Problems with Biological Assessments and TMDLs

- Biological Assessments in VA
 - Benthic metric based on a reference community
 - Impairment = pass/fail
- Benthic TMDLs in urban environments
 - Data driven
 - Pollutant driven
 - **High bar for success**

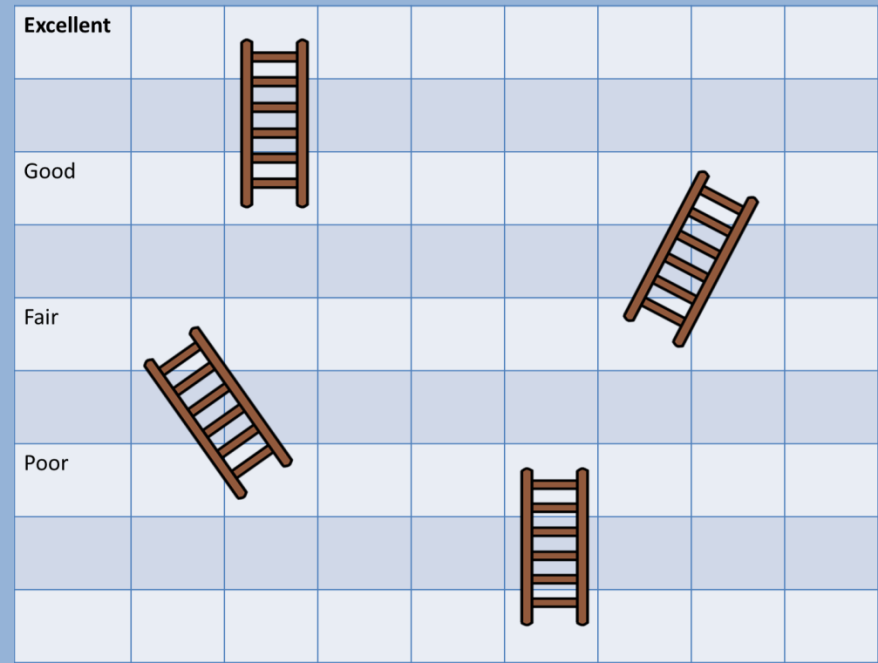
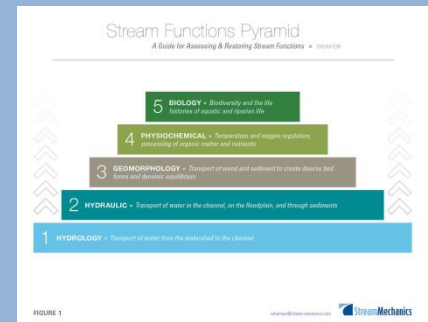
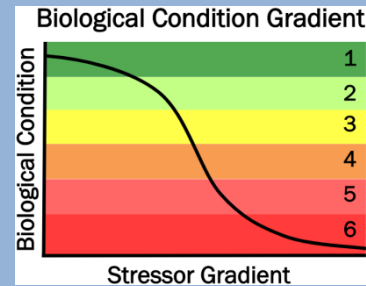


Potential Solutions

- Tiered Aquatic Life Use
- Biological Condition Gradient
- Better Use of Assessment Subcategories

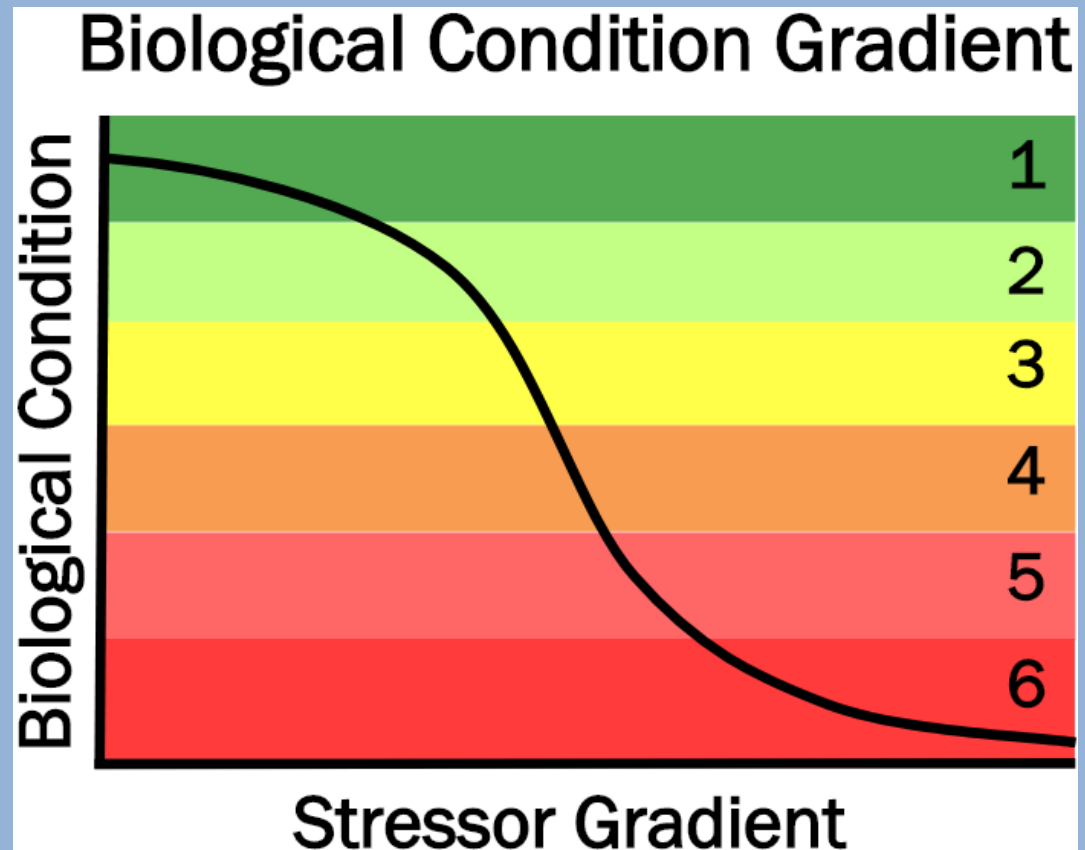
Tiered Aquatic Life Use

- Tiers based on incremental goals
 - Tiers can be based on biological goals
 - Tiers can also be based on functional goals
 - It's all about attainable increments
- Attainable goals with anti-degradation protections
- Tiered = you can climb
 - Not a lower bar
 - A more practical bar that can move up with progress
- Communicate incremental progress



Biological Condition Gradient

- The BCG describes a biological condition related to increasing levels of stress on a scale from 1-6
- Built off of organism stressor response relationships
- Quantifies BPJ



Biological Condition Gradient (cont.)

- Benefits for urban streams
 - Provides measurable, incremental goals
 - Can be used for TALU based on stressors as opposed to a reference community
 - Shows biological progress or regress as the score changes in response to changes in stress

Better Use of Assessment Subcategories

- Current assessment in VA:
 - 5A or 4A for Benthic Scores
- TMDL/TMDL-alt use 4A or 5R for restoration goals
 - Category 4A for **Sediment**
 - Category 5R (5-alt) for non-pollutants:
 - **Flow**
 - **Lack of Riparian Vegetation**
 - **Habitat modification**
- Absent TMDL-alt:
 - Category 4C for non-pollutants
- Gives a more detailed implementation goals
- Better communicates challenges to public and permittees

Example benthic stressor analysis

Most probable Stressors:

- Flow
- Lack of Riparian Vegetation
- Habitat modification
- Sediment



Conclusion

- Biological goals in urban environments are hard to attain
- Costs to meet goals are high
- May promote the perception that goals are unattainable leading to lack of support
- Better communication on progress, goals, and objectives
 - TALU, BCG, and better use of assessment categories
 - All communicate in greater detail what needs to be done, while allowing for progress to be shown on interim goals

