Healthy Watersheds Indicator

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Healthy Watersheds Goal Implementation Team
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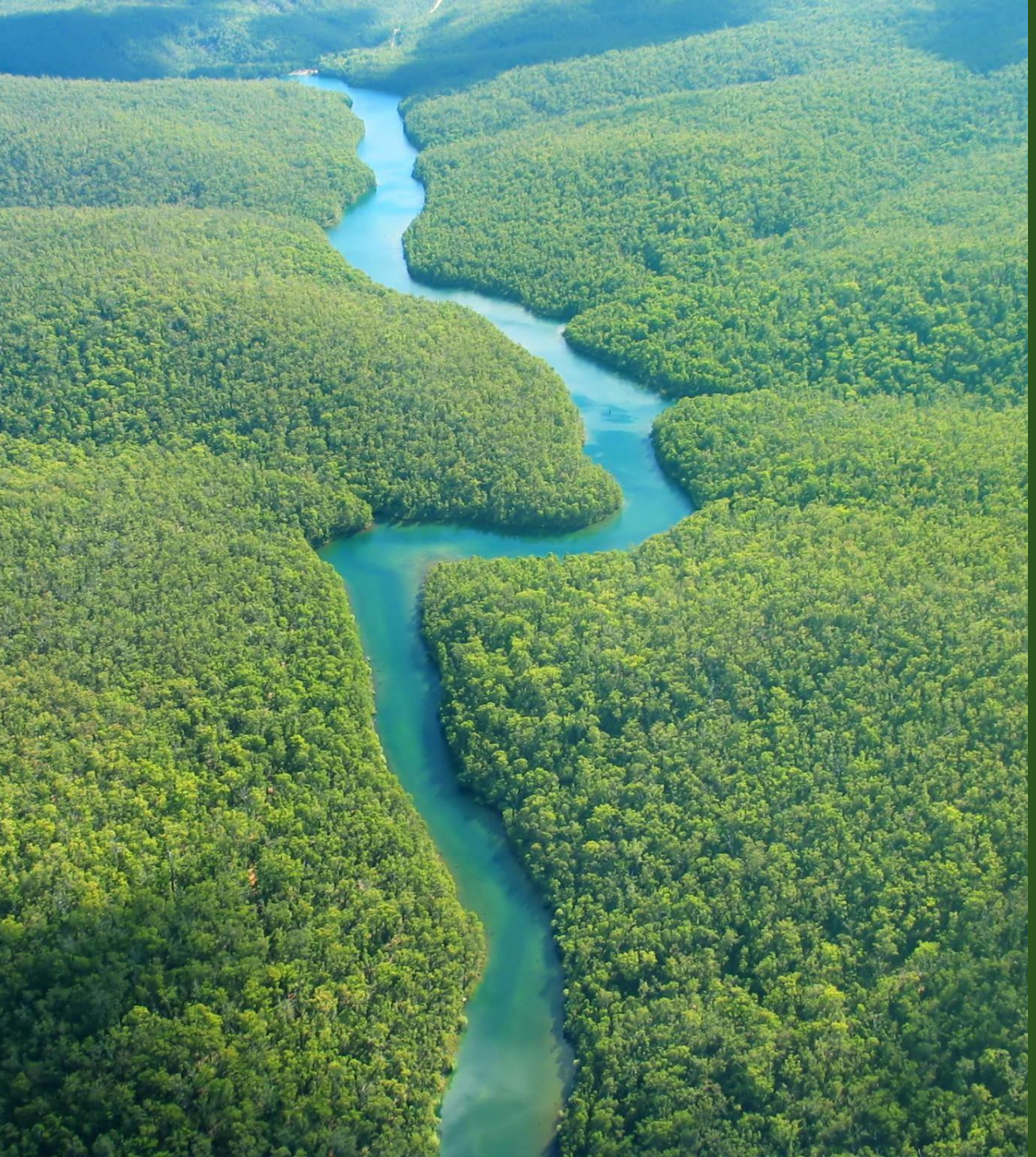
Healthy Watersheds Goal

Goal: Sustain state-identified healthy waters and watersheds recognized for their high quality and/or high ecological value

Outcome: 100 percent of state-identified healthy waters and watersheds remain healthy.



Healthy Watersheds Indicator Action Team

- **Goal:** Identify indicators of watershed health that the Bay Program should monitor on Chesapeake Progress to assess the HW outcome.
- **Challenges:**
  - What is a healthy watershed?
  - What are the factors of watershed health (landscape condition, biological condition, etc.)?
  - What are measurable indicators of these factors? (stream temperature, conductivity, protected lands, etc.)?
  - How do stream health and watershed health compare?
  - How do we monitor healthy watersheds across jurisdictions that define it differently?
  - What is the structure of the indicator? Suite of indicators? How do we monitor factors of health that are measured by numerous metrics (landscape condition = development, forest and wetlands, agriculture)?

Indicator Structure

Status

Factors that indicate the current health status of a watershed.

Indicators/Factors of Watershed Health (Biotic health, geomorphology, habitat, etc.?)

Influencing Factors

Metrics, that can be monitored, that impact watershed health

Metrics whose trend affect the status of watershed health factor(s), either positively or negatively (e.g. increase in riparian forest buffers cool streams which improve fish health)

Vulnerability

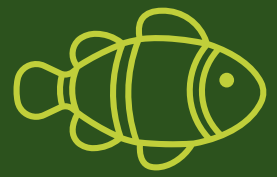
Metrics that indicate a watershed is at risk to degradation.

Indicators of vulnerability under different stressors (climate, development, etc.)

What is a “Healthy” Watershed?

Land Protection?

Public access? Parks? Recreation?



Habitat?

Black Duck? Brook Trout? Others?

According to the states…

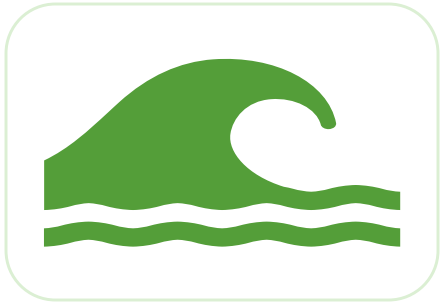
Jurisdiction	Definition of "Healthy"	Categories
D.C. *	No identified healthy watersheds.	
Delaware*	Total Maximum Daily Loads (TMDLs) are achieved, and their surface water quality standards are met (toxins, nutrients, DO, temperature, etc.).	Water quality
Maryland	Tier II waters. Biological characteristics are significantly better than minimum water quality standards.	Biology
New York	Absence of use restrictions (nutrients, DO, etc.).	Water Quality
Pennsylvania	High Quality or Exceptional Value waters. Biological (wilderness trout stream and benthics), chemical (DO, pH, toxics), and habitat assessments (located in designated state or national protected, owned, or managed areas).	Biology, Water Quality, Habitat, Land Protection
Virginia	High aquatic integrity and ecologically healthy waters. Fish and macroinvertebrate communities, instream and riparian habitat. High numbers of native/broad diversity of species, few or no non-native aquatic species, few generalist species.	Biology, Habitat.
West Virginia	Tier 3 waters. Exceptionally high benthic macroinvertebrate communities, located in Federal Wilderness areas, state and national parks, national forests, and protected by the Wild and Scenic Rivers Act, naturally reproducing trout streams.	Biology, Habitat, Land Protection

* Currently no healthy watersheds.

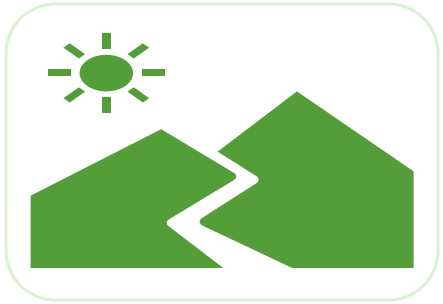
According to CBP and EPA…

CHWA 2.0 Health Categories and EPA Watershed Health Index

Landscape Condition

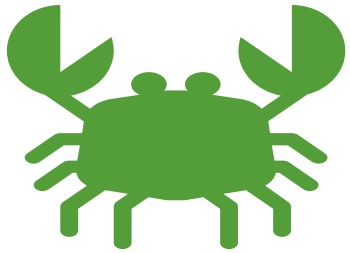


Hydrology

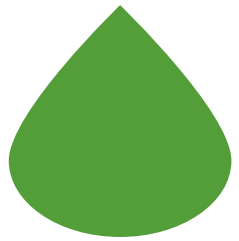


Geomorphology

Habitat



Biological Condition



Water Quality

Jurisdiction	Water Quality	Biology	Habitat	Land Protection	Hydrology	Geomorphology	Landscape Condition
D.C.							
DE	X						
MD		X					
NY	X						
PA	X	X	X	X			
VA		X	X				
WV		X	X	X			
CBP	X	X	X		X	X	X
EPA	X	X	X		X	X	X

Factors of Watershed Health Comparison

Jurisdiction	Water Quality	Biology	Habitat	Land Protection	Hydrology	Geomorphology	Landscape Condition
D.C.							
DE	X						
MD		X					
NY	X						
PA	X	X	X	X			
VA		X	X				
WV		X	X	X			
CHWA	X	X	X		X	X	X
EPA	X	X	X		X	X	X

Factors of Watershed Health Comparison – Stream Health?

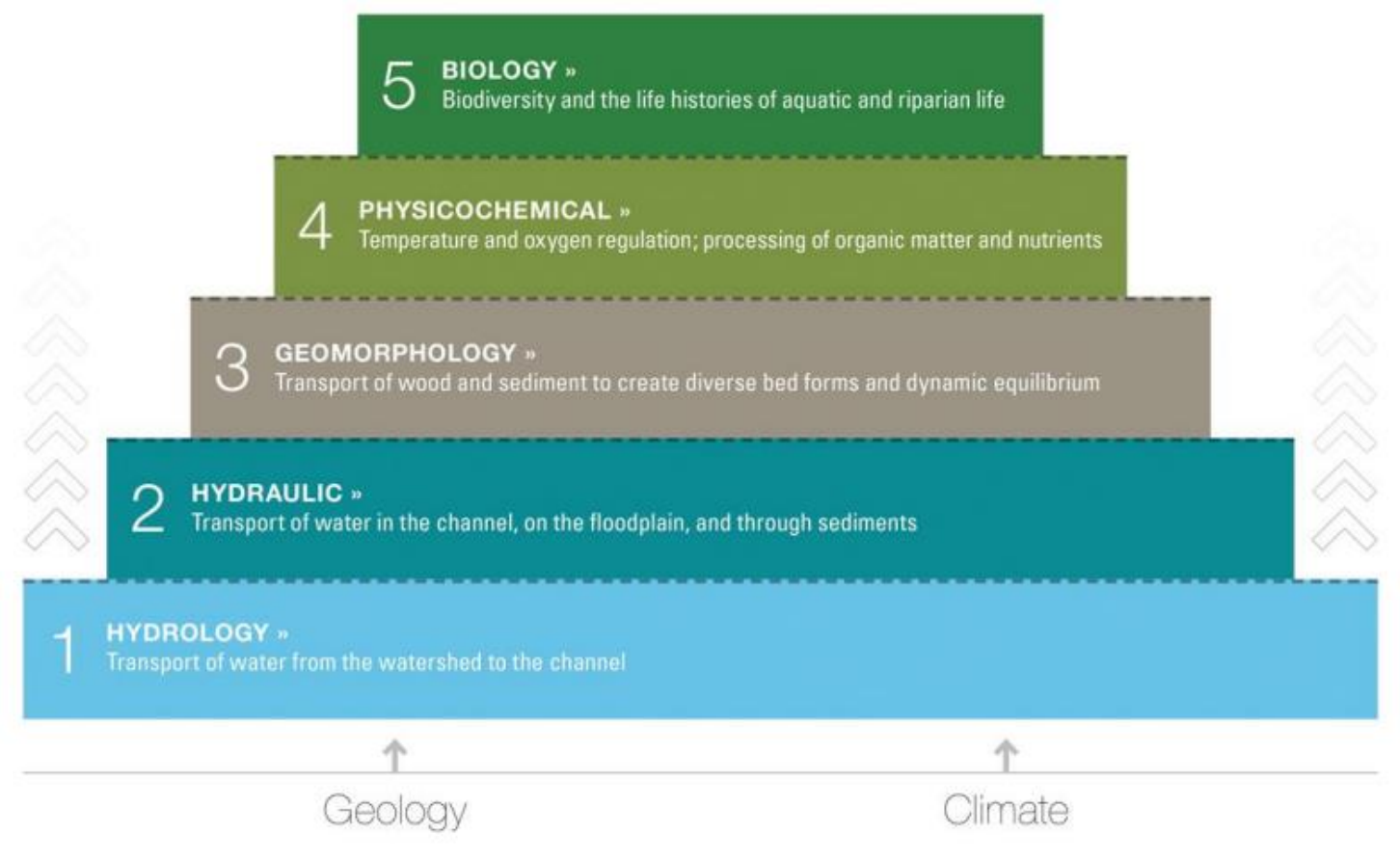
Watershed and Stream Health: Related but Different?

- In stream conditions often reflect the health of a watershed.
- An increase in impervious cover can trigger negative effects in streams, including increases in temperature and channel incision.
- Is a “healthy” stream in a heavily developed watershed a healthy watershed?
- Is a heavily forested and protected watershed with unhealthy stream conditions a healthy watershed?

Stream = water and riparian

Watershed = Landscape

Stream Health Workgroup and HWGIT: Need for Collaboration

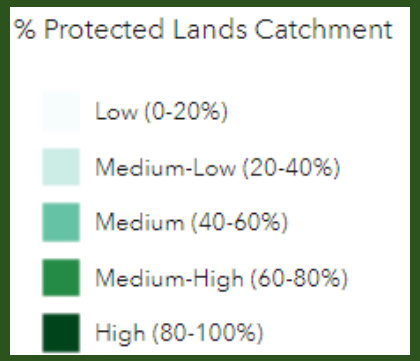


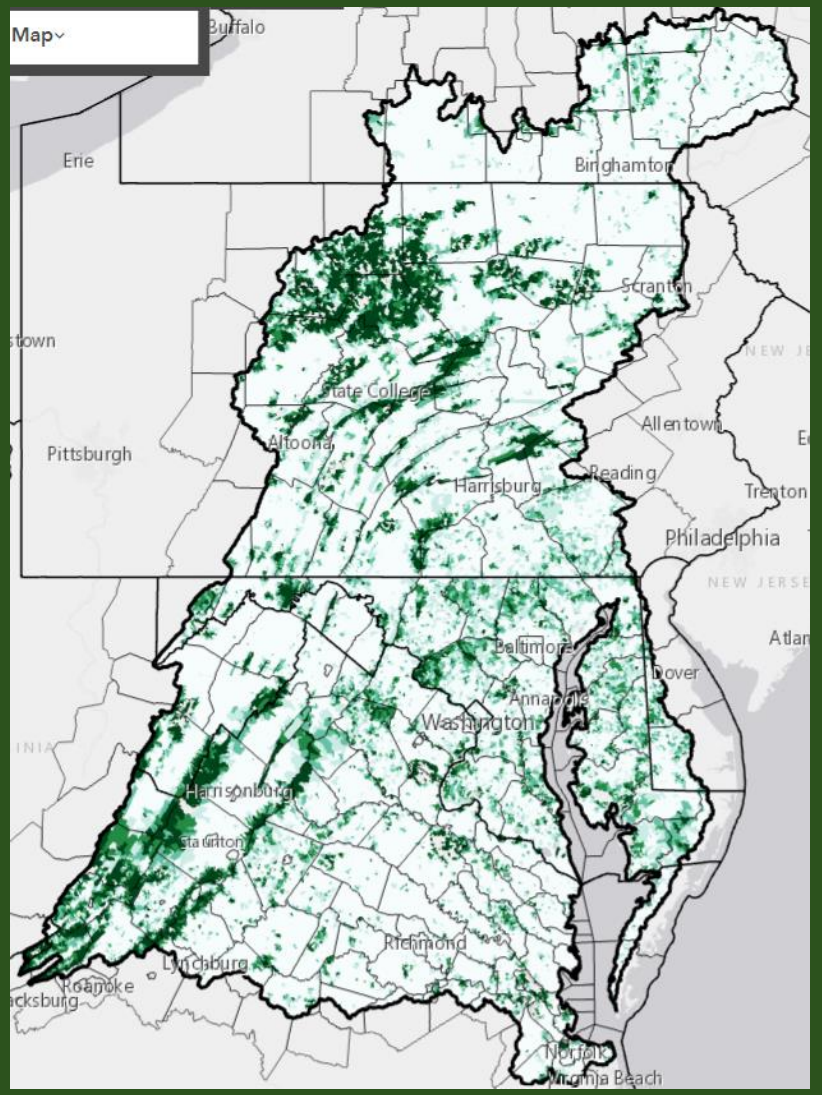
Harman, W., R. Starr, M. Carter, K. Tweedy, M. Clemmons, K. Suggs, and C. Miller. 2012. A Function-Based Framework for Stream Assessment and Restoration Projects. US Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds, Washington, DC EPA 843-K-12-006.

- Stream health workgroup consists of hydrology, geomorphology, and stream health experts.
- Stream health indicators:
  - Current = Chessie BIBI at the HUC scale
  - Planned = "Stream Health Pyramid" at the catchment scale (1:24k)

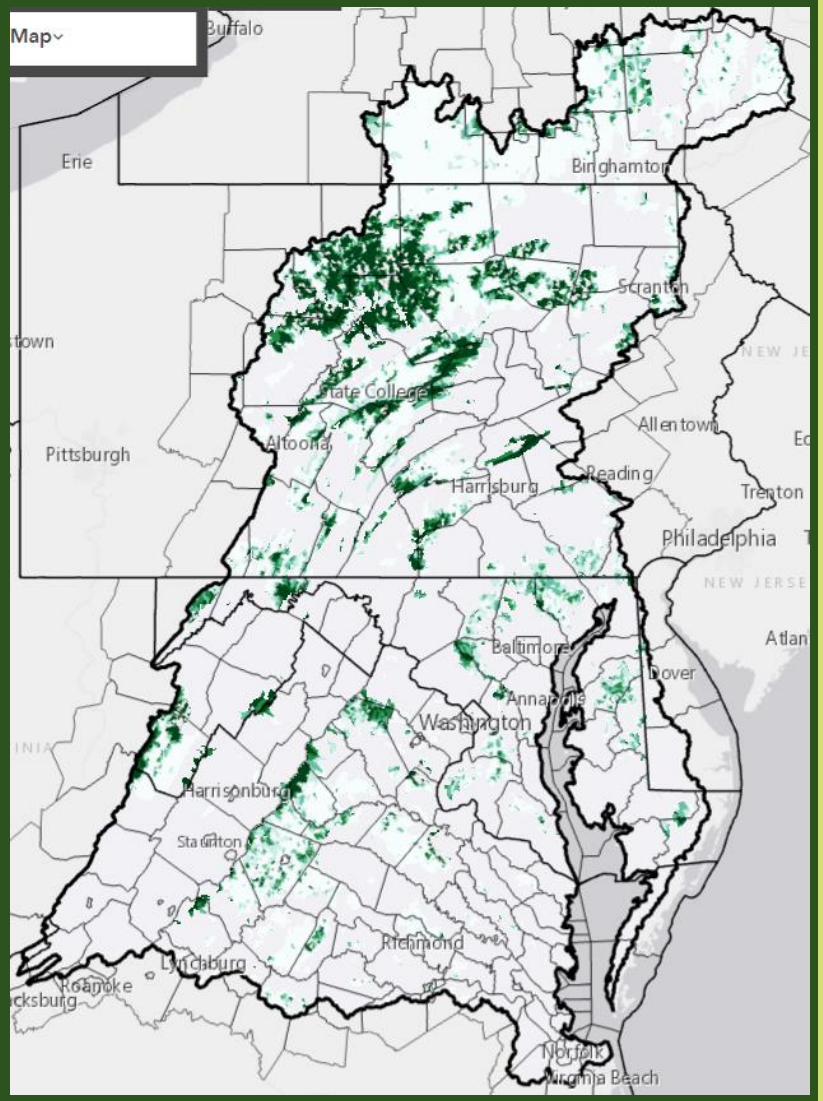
Role of the HWGIT?

- Monitoring the health of the landscape!
- Some examples:
  - Protected lands
    - Forest and wetlands that are protected?
  - Development
    - Impervious lands?
    - Forest loss to Development?





% Protected Lands



% Protected Lands in SIHW

Discussion Questions

- Should the Healthy Watersheds Indicator(s) focus on landscape condition, stream condition, river corridor condition or all of the above?
- What's the relationship between the healthy watersheds and stream health indicators?
- What landscape (or non-landscape) metrics should we monitor in addition to impervious cover, natural lands, riparian conditions?

Want to be More Involved in Healthy Watershed Indicator Discussions?

Next meeting is tomorrow from 3-4pm!

Contact Sophie Waterman at swaterman@chesapeakebay.net

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