TETRA TECH

Implementing the Chesapeake Healthy Watersheds Assessment in Maryland's Tier II Watersheds

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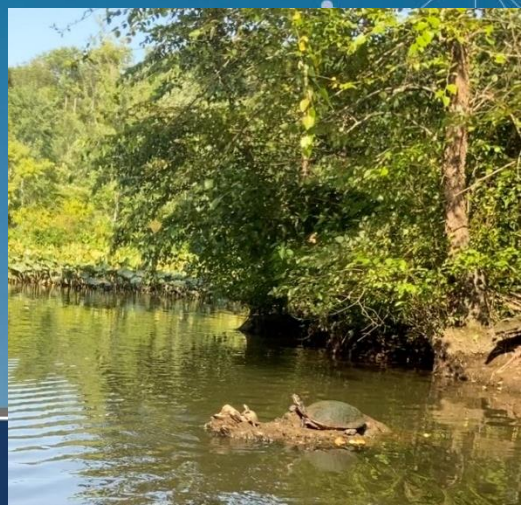
Tetra Tech

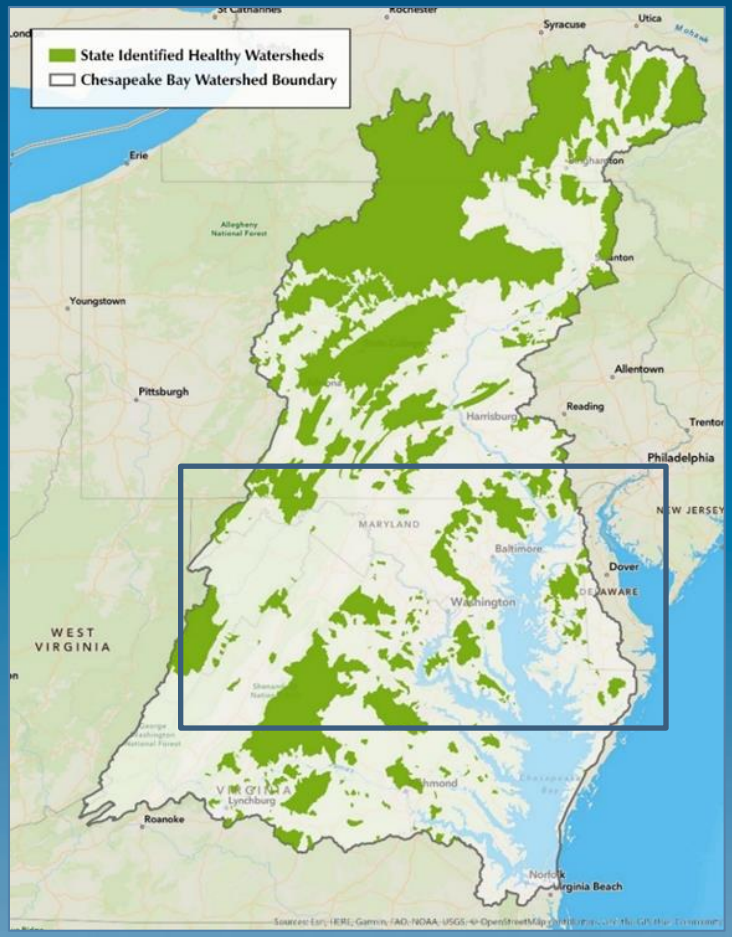
Maintain Healthy Watersheds
GIT Meeting
December 2020

Overview: Project Purpose

- Refine and customize the CHWA for application in Maryland
- Evaluate statistical relationships between landscape indicators and on-the-ground (*or better yet…in-the-stream!*) diagnostic measures of stream condition
- Develop approach that can be replicated in other jurisdictions using state, local, or regional data



State-Identified Healthy Watersheds



High-quality streams in Maryland are classified as Tier II waters based on Maryland Biological Stream Survey data

- High scores for fish and benthic Indices of Biotic Integrity (IBIs)

Applying the HWA in Maryland

- **To provide data to support management decision-making, particularly for maintaining the health of healthy watersheds**
  - Assess current watershed condition
  - Track condition over time
  - Provide early warning signs – vulnerability to degradation
  - Identify resiliency – ability to sustain good watershed health in spite of stressors

Understanding Influences on Watershed Health

- **Seek better understanding of statistical relationships between landscape predictors and quantitative measures of stream health**
- **Diagnostic measures may include MBSS or other stream response data such as**
  - Fish and benthic IBI
  - Habitat metrics
  - Water quality data
  - Stream and floodplain geomorphic measurements

Stream (Watershed) Health

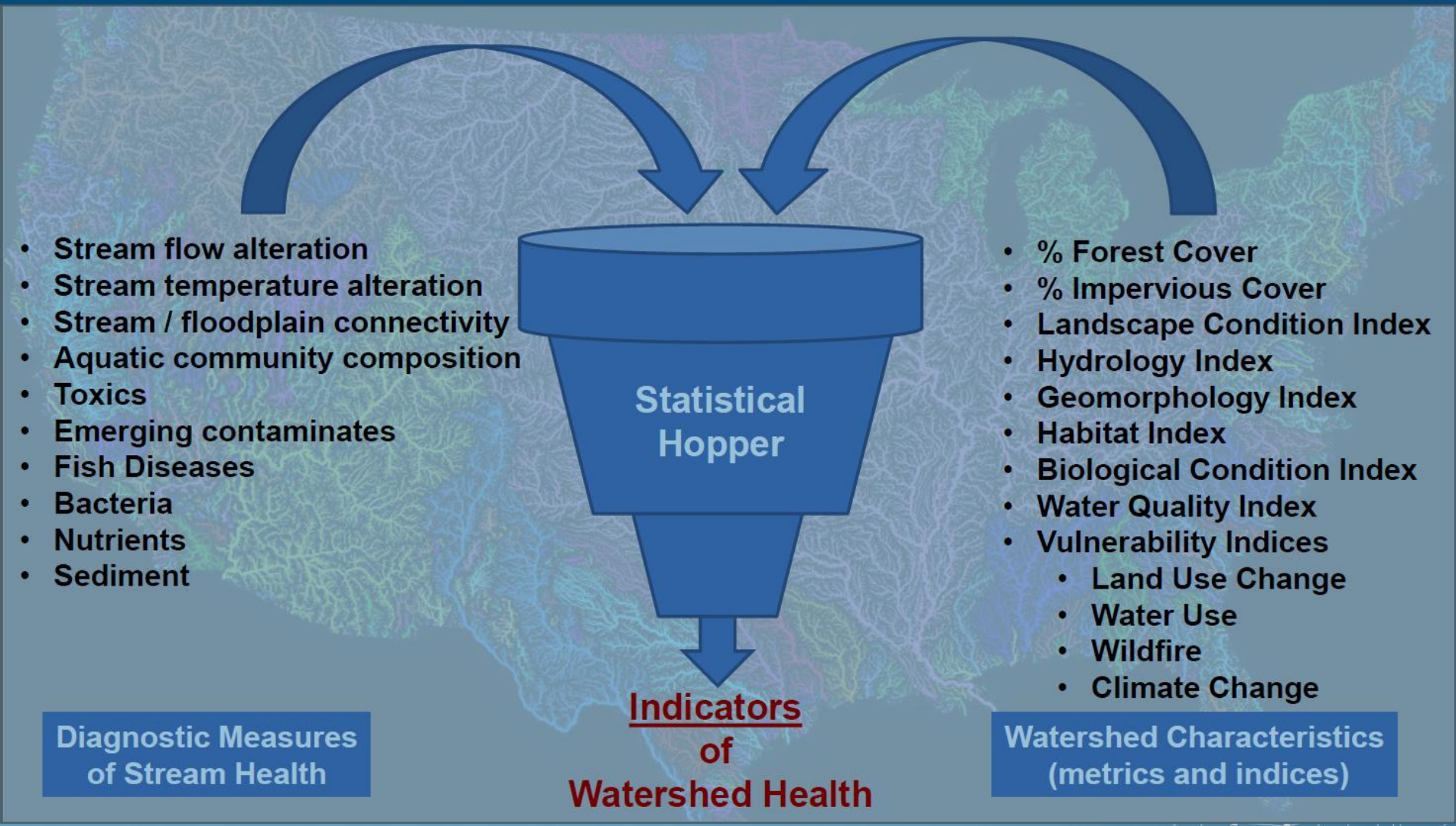
Diagnostic Measures

- Stream flow
- Stream temperature
- Stream incision / floodplain connectivity
- Aquatic community composition
- Toxics
- Disease
- Nutrients
- Sediment

Watershed Characteristics

- Population density
- Impervious cover (%)
- Tree cover (%)
- Hydric soils (%)
- Road x stream crossing density
- Probability of land conversion

Source: Peter Claggett, USGS CBP



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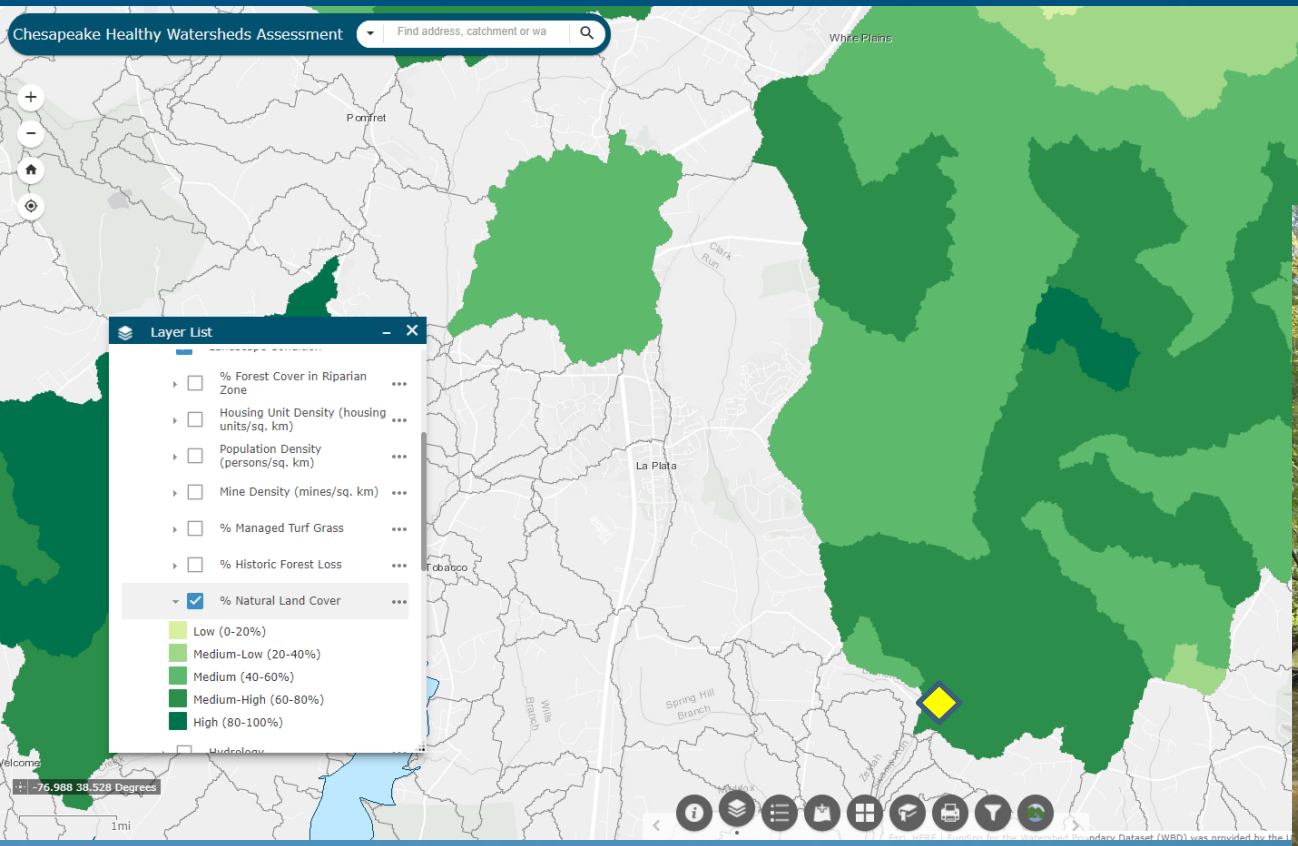
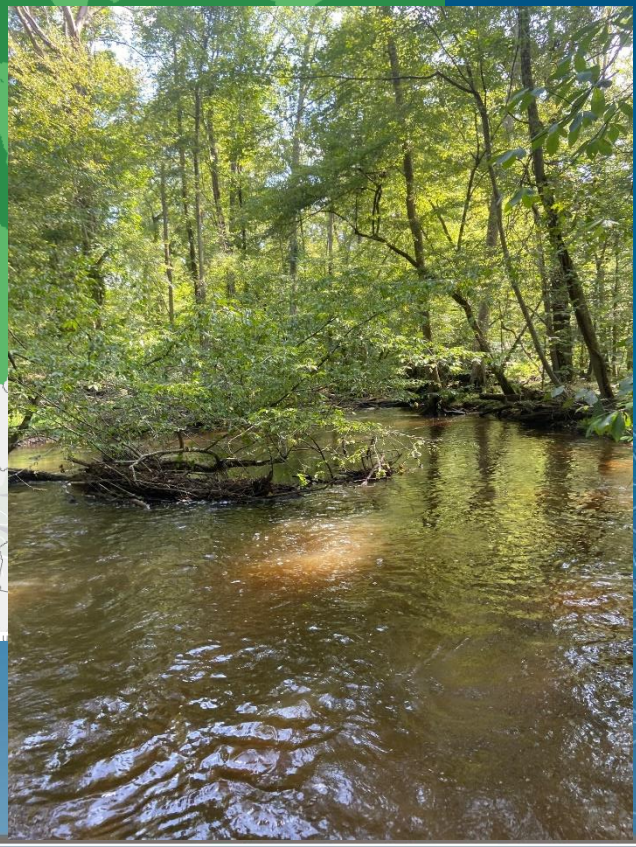
Example: Zekiah Swamp





CHWA Metric: % Natural Land Cover

Landscape Metrics

- **Examples**
  - Condition: Percent developed land
  - Vulnerability: Projected increase in developed land
  - Resiliency: Number/extent of Urban BMPs

Process for Developing the MD HWA

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- Scientifically-based review of factors influencing MD streams
- Select candidate metrics
- Identify MD-specific data sources
- Review statistical approaches

Coordination with Core Team, Project Advisory Team, and GIT

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- Gather source data
- Develop code (R, Python)
- Calculate and test metrics

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Create Strategy for MD HWA Development

- Scientifically-based review of factors influencing MD streams
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Develop Metrics

- Gather source data
- Develop code (R, Python)
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Assess Statistical Relationships

- Evaluate predictive ability of landscape factors, related to measures of stream health

Provide Documentation, Data, and Tools for Sharing

Coordination with Core Team, Project Advisory Team, and GIT

Process for Developing the MD HWA

Create Strategy for MD HWA Development	Develop Metrics	Assess Statistical Relationships	Provide Documentation, Data, and Tools for Sharing
• Scientifically-based review of factors influencing MD streams • Select candidate metrics • Identify MD-specific data sources • Review statistical approaches	• Gather source data • Develop code (R, Python) • Calculate and test metrics	• Evaluate predictive ability of landscape factors, related to measures of stream health	• Report • Geodatabase • Manual • Video tutorial • iMAP integration

Coordination with Core Team, Project Advisory Team, and GIT

Time For Your Ideas!
Q1

- What factors should we investigate as candidate health, vulnerability, and resiliency metrics in the MD HWA?

Q2

- How could this assessment be customized for your jurisdiction?

Q3

- At what scale would the assesment be most useful? (e.g., 1m, catchment, HUC12, County, 30m etc.)

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