



Forest Fragmentation Data

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**Conservation
Innovation Center**
Spatial Data Science Lab of the
Chesapeake Conservancy



Presentation Outline

- Initial look at dataset
- Recap of project premise
- Methodology design & dataset summary
- Use case examples
- Online data viewer
- Use case discussion & questions

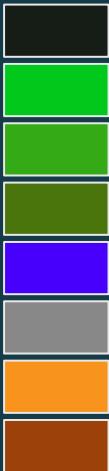


What is the forest fragmentation dataset?

- A 1-meter resolution spatial dataset derived from the 2024 ed. CBP LULC data (2021/2022 conditions)
- Covers entire Chesapeake Bay watershed
- Visual and quantitative measure of forest fragmentation



Fragmentation Classes



Edge: [0-15m]

Transitional: (15-45m]

Interior: (45-100m]

Core: >100m

Perforation

Canopy Gap

Connected Canopy

Islet

Example: Howard County, MD



Recap: Method Design

- Fragmentation methods were inspired by methods used for the Maryland Forest Technical Study (MFTS)
- Methods were updated iteratively based on feedback from members of the USFS, CBP Forestry Workgroup, and Advisory Subcommittee
- Special thanks to everyone who has contributed their input for methodology design
- Details about watershed-wide plantable areas analysis (also based on MFTS) were presented at [10/8/25 FWG meeting](#)



Technical Study on Changes in Forest Cover and Tree Canopy in Maryland

November 2022



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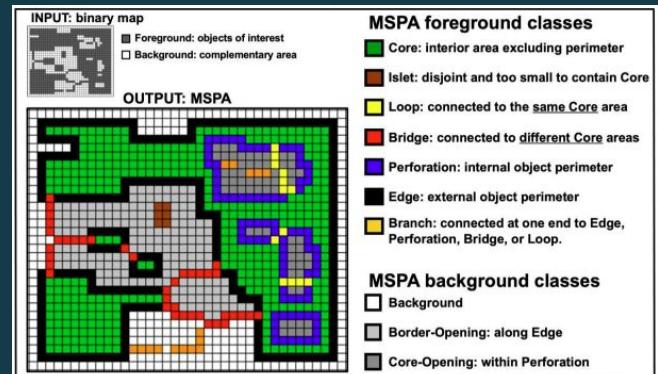
Chesapeake
Conservancy

University of Vermont
Spatial Analysis Lab



Fragmentation Analysis Methods

- LULC classes included in analysis: Forest, Forested Other, Harvested Forest, and Tree Canopy over Turf
- Basis of methods: Morphological Spatial Pattern Analysis (MSPA)* using 15m edge width, with additional pre- and post-processing
 - Detailed description of methods available in technical documentation
- Data needs identified through conversations with USFS, FWG, CBP, and other potential users
 - Precision
 - Flexibility
 - Simplicity

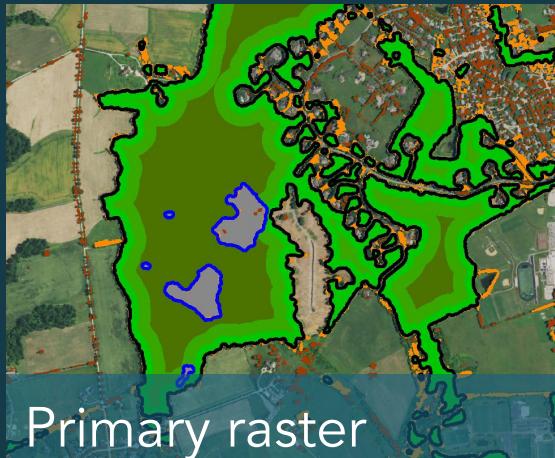


MSPA guide's input/output summary

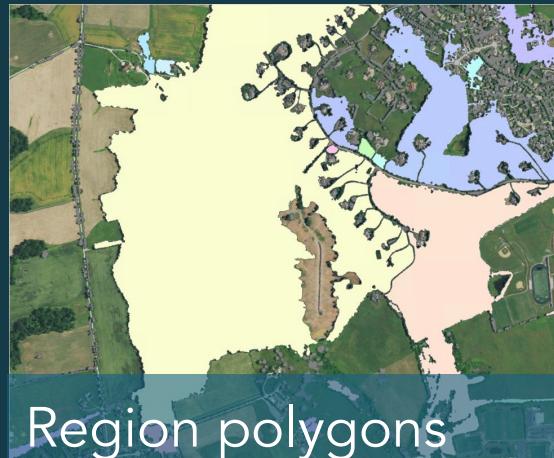


Forest Fragmentation Methodology Design - Precision

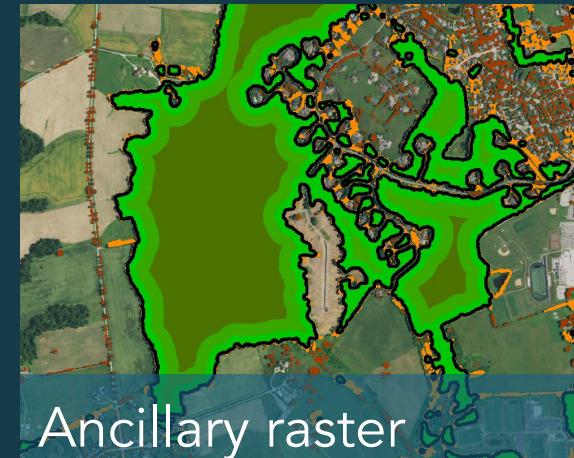
- Maintain as much detail as technically possible to facilitate use cases across a range of spatial scales
- Primary output is a 1m raster, with adjustments to account for 9m² minimum mapping unit (MMU) of the LC dataset
- Fragmentation metrics include class areas, intactness ratio (polygons layer)



Primary raster



Region polygons

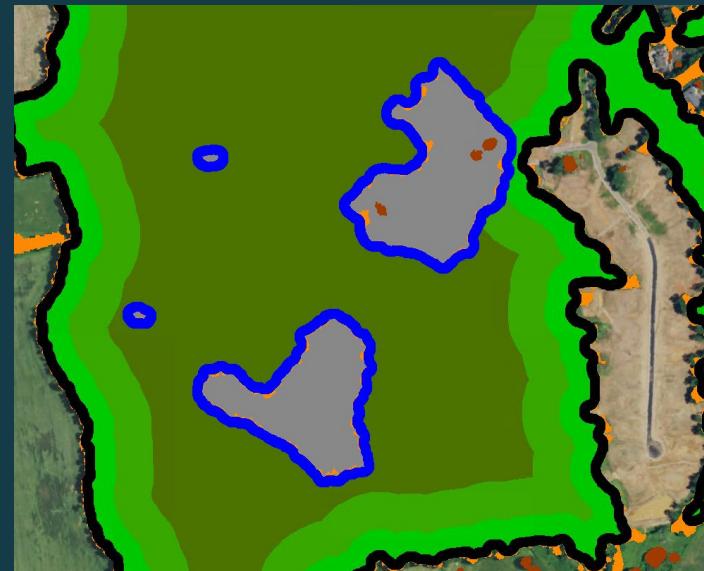


Ancillary raster

Forest Fragmentation Methodology Design - Flexibility



- Different use cases, particularly between urban and rural areas, have different data needs
- MSPA “core” class is split into multiple classes based on 3 edge widths: 15m, 45m, 100m
- Canopy gaps are formatted to allow users to keep or remove them using ancillary raster

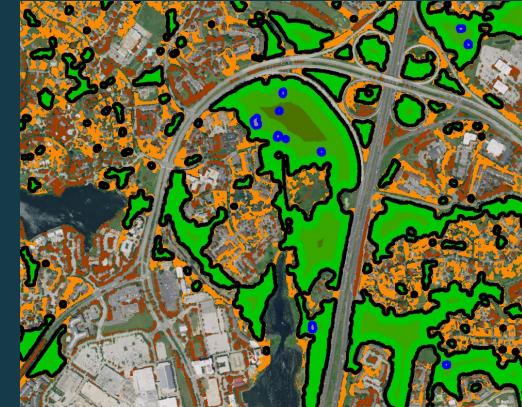
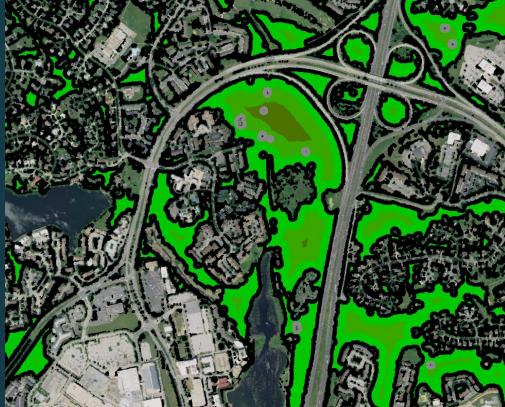


Transitional: (15-45m)
Interior: (45-100m)
Core: >100m



Forest Fragmentation Methodology Design - Simplicity

- Dataset needs to be easily communicable to a range of audiences
- MSPA output classes have been aggregated
- Further aggregated visualization options are included in documentation (example images below)

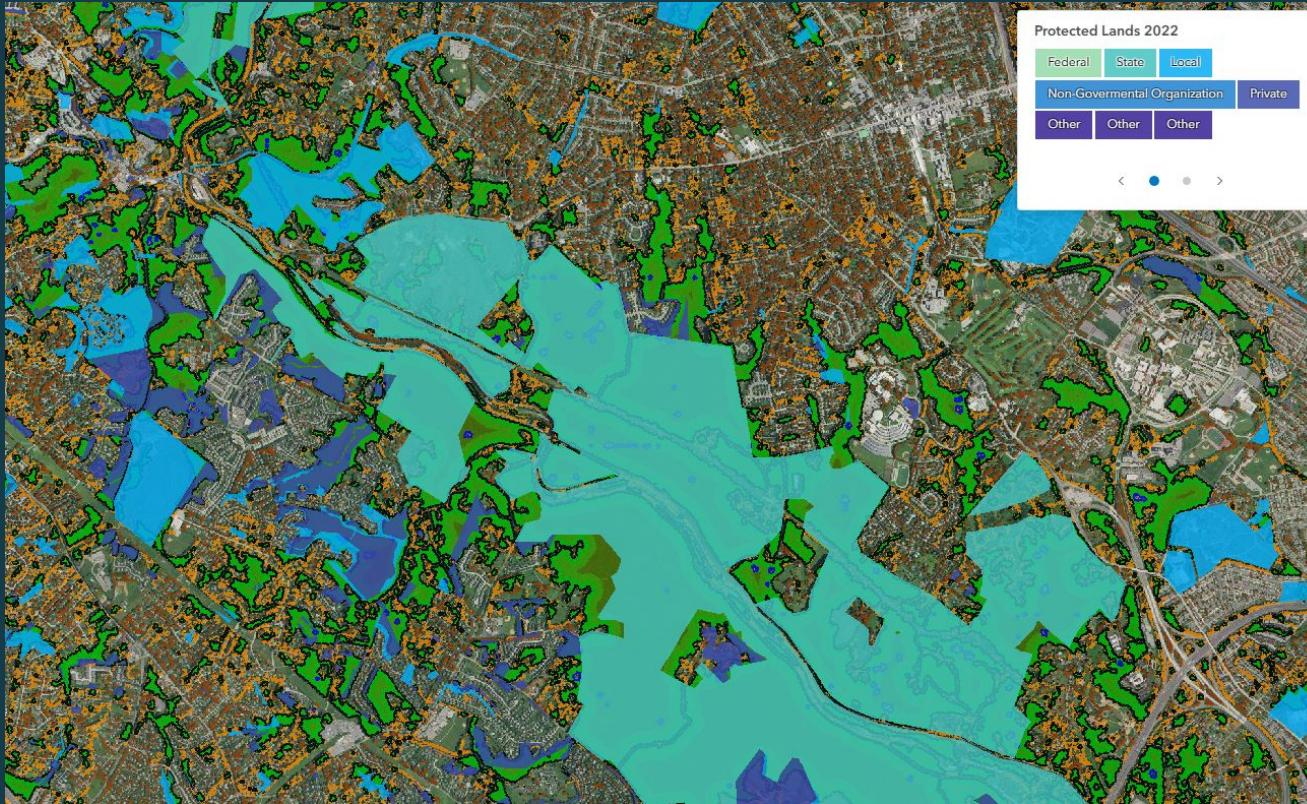




Use Case Discussion



Possible Applications: Vulnerable Forests



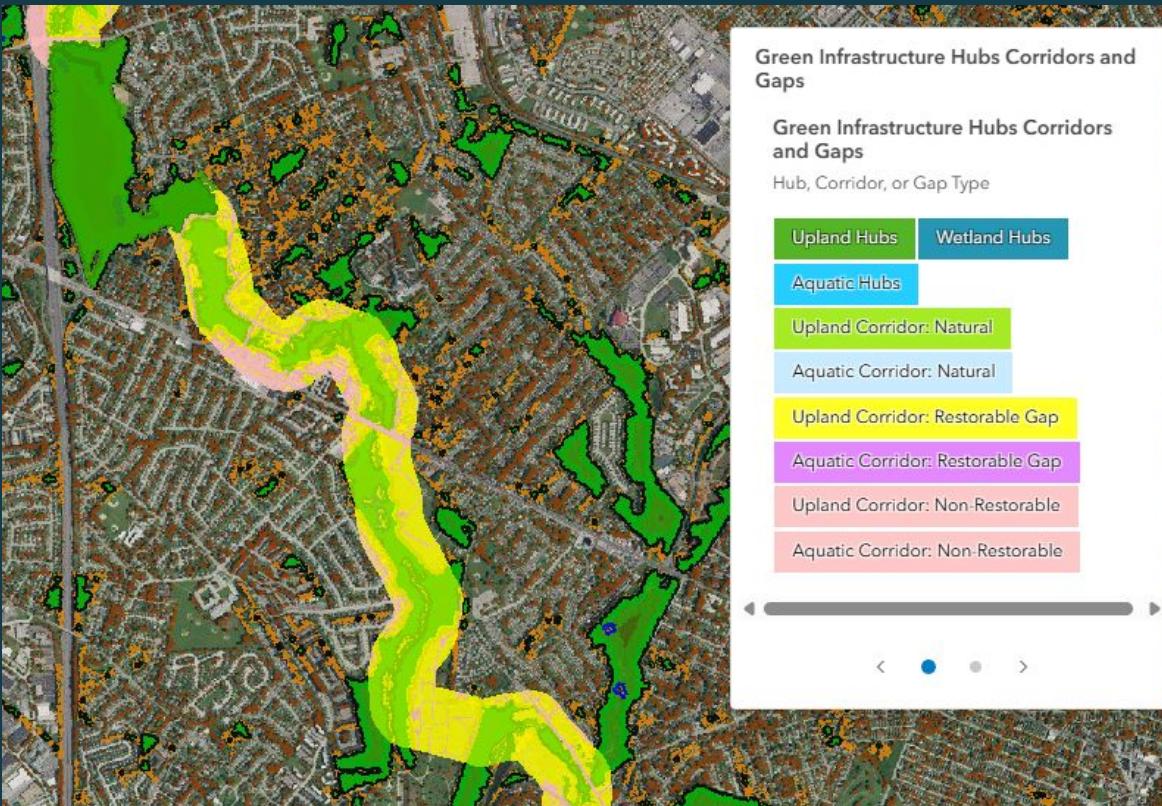


Possible Applications: Canopy Expansion



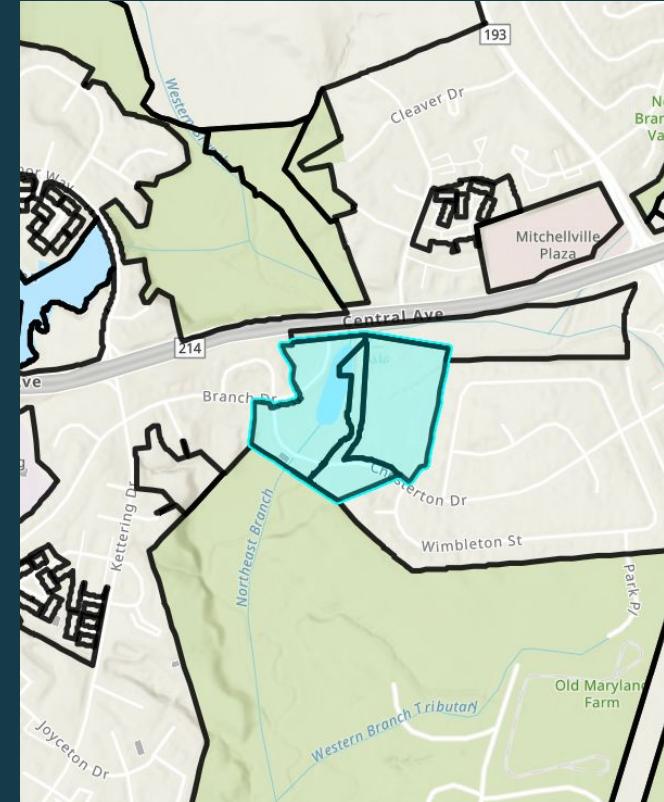
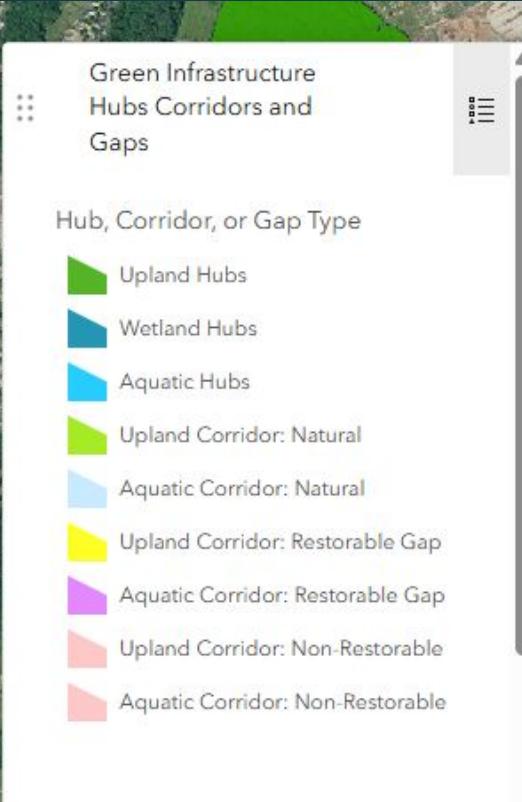
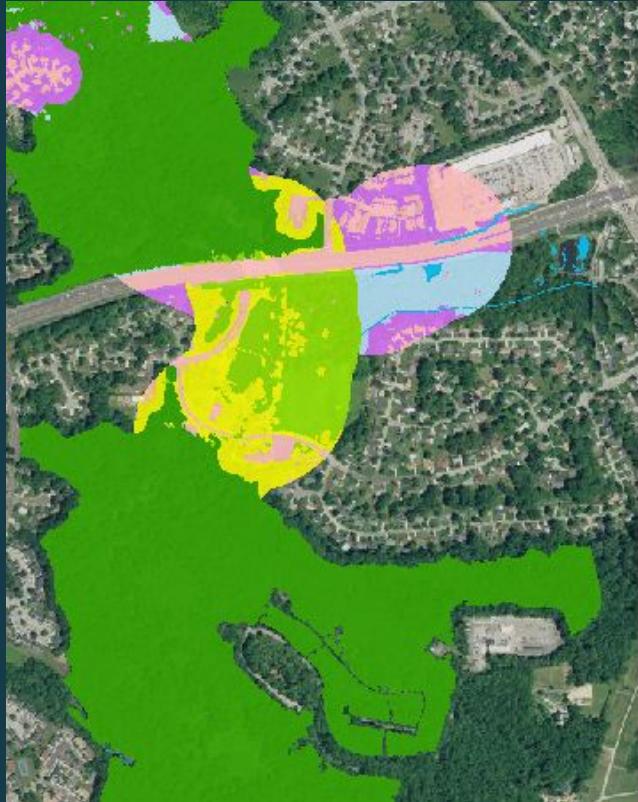


Possible Applications: Hubs/Corridors





Possible Applications: Parcel Planning





Possible Applications: Climate Resilience





Discussion