Characterizing Land Cover/Use Conditions in the Chesapeake Bay Watershed

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Local land use and parcel data

- Low-density Residential
- Recreation
- Agriculture
- Roads

High-resolution land cover data

- Impervious surfaces
- Tree canopy
- Low vegetation
- Water

Chesapeake Bay Watershed Land Uses

- Impervious-Roads
- Forests
- Turf Grass
- Open Space
Remote Sensing Data

2013 NAIP
Ortho-imagery
LiDAR

nDSM
DEM
NDVI
NIR
Blue
Green
Red
Methods

- Initial semi-automated feature extraction with 900x the resolution of NLCD
  - Rule-based, object oriented image classification
Methods

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- Manual corrections
Frederick County
2013 Land Cover
Frederick County
2013 Land Use
Phase 6 Error Rates for 2013 conditions

Census of Agriculture (2012)

- Mean: 83.8% (59.8% - 95.2%) (0.05 – 0.95 percentiles)
- Applied to cropland, pasture, mixed open, and turf grass
- VA Turf Grass assigned an accuracy of 72%. VA crop and pasture may receive accuracies of 95% and 91% respectively.

Impervious roads: 92% (74% - 100%)

Impervious Non-Roads: 93% (88% - 97%)

Tree Canopy over Impervious: 59% (19% - 92%)

Tree Canopy over Turf Grass: 94% (83% - 99%)

Water: 98% (96% - 100%)

Forest: 98% (96% - 99%)

Wetlands: 95% assigned to all because NWI was “burned in”
2013 Land Use

- AG: 21%
- CON: 0%
- FOR: 61%
- IMP: 4%
- MO: 3%
- TG: 9%
- WAT: 2%
- CON: 0%
## Variation in Developed Lands in Phase 5.x and 6.0 models

<table>
<thead>
<tr>
<th>Model Version</th>
<th>Impervious Surface (acres)</th>
<th>Pervious Surface (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 5.3 (2002) (Landsat data only)</td>
<td>623,868</td>
<td>1,991,690</td>
</tr>
<tr>
<td>Phase 5.3.2 (2001)(^a) (Landsat + Roads + Housing)</td>
<td>1,207,346</td>
<td>3,143,388</td>
</tr>
<tr>
<td>Phase 6.0 (2001) (High-res Land Use)</td>
<td>1,542,291(^b)</td>
<td>3,144,631(^c)</td>
</tr>
</tbody>
</table>

\(^a\) Claggett, et al., 2013  
\(^b\) 30% roads, 57% buildings and 13% is trees over impervious  
\(^c\) 76% turf grass and 24% trees over turf grass