

**Chesapeake Bay Program**  
*A Watershed Partnership*

# **Updating High-Res Land Use for the Chesapeake Bay Watershed**

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# Development of 1m-Resolution Land Cover Data

2013 NAIP

Ortho-  
imagery

LiDAR



nDSM



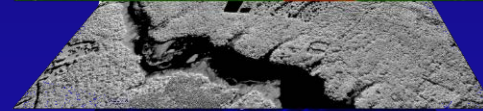
DEM



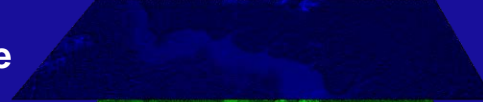
NDVI



NIR



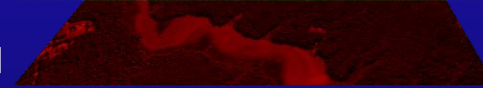
Blue



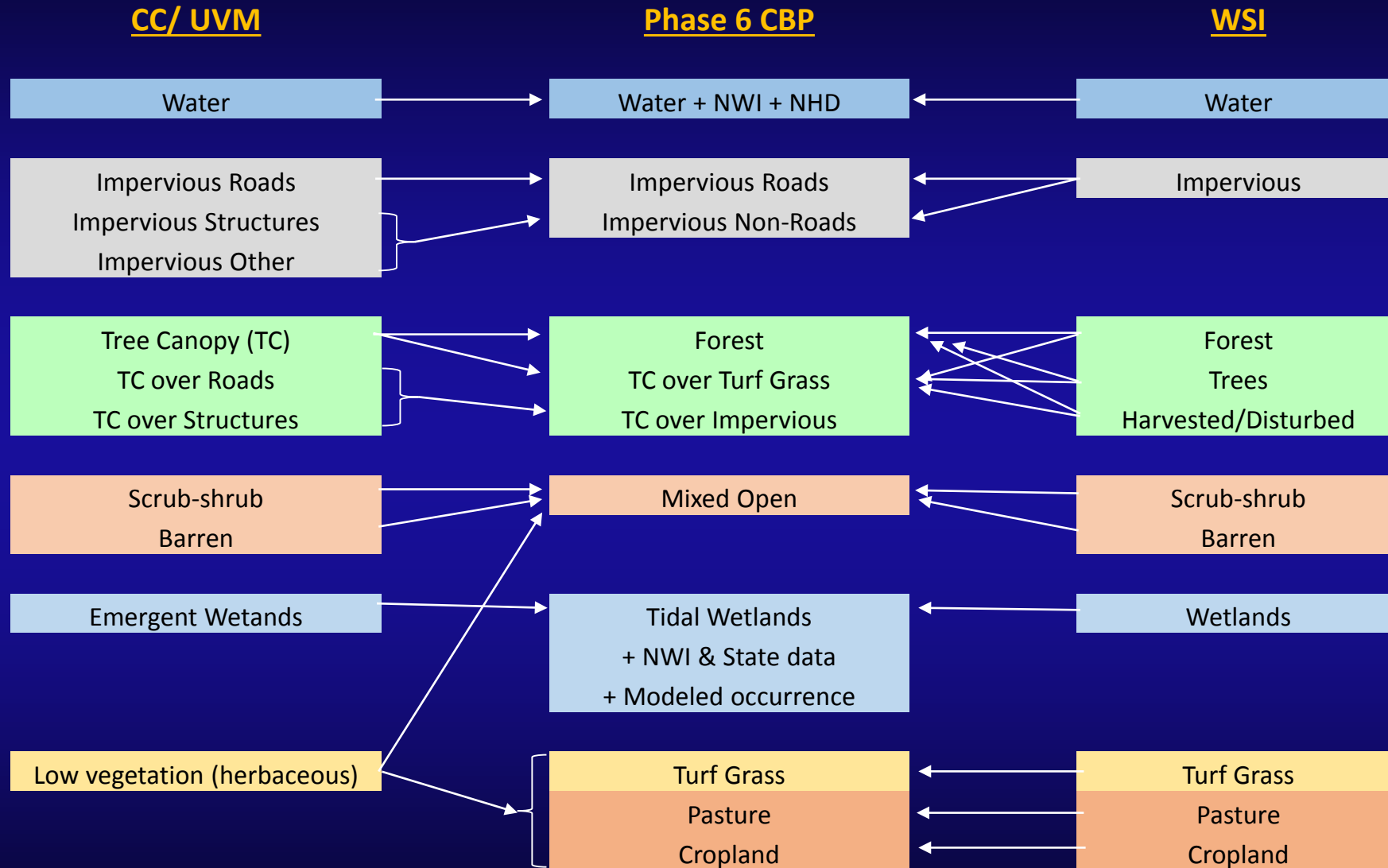
Green



Red



# Land Cover to Land Use Crosswalk

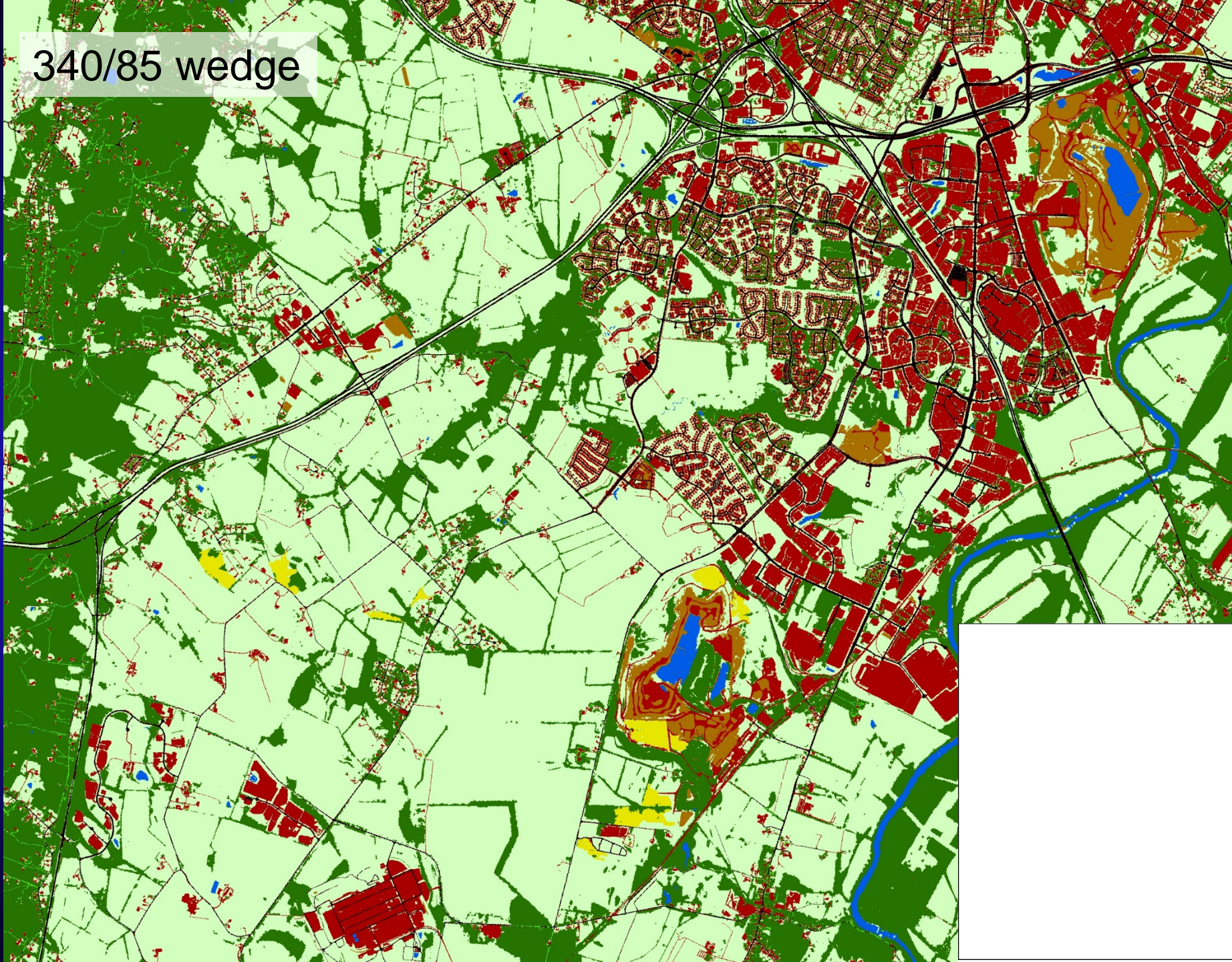




340/85 wedge

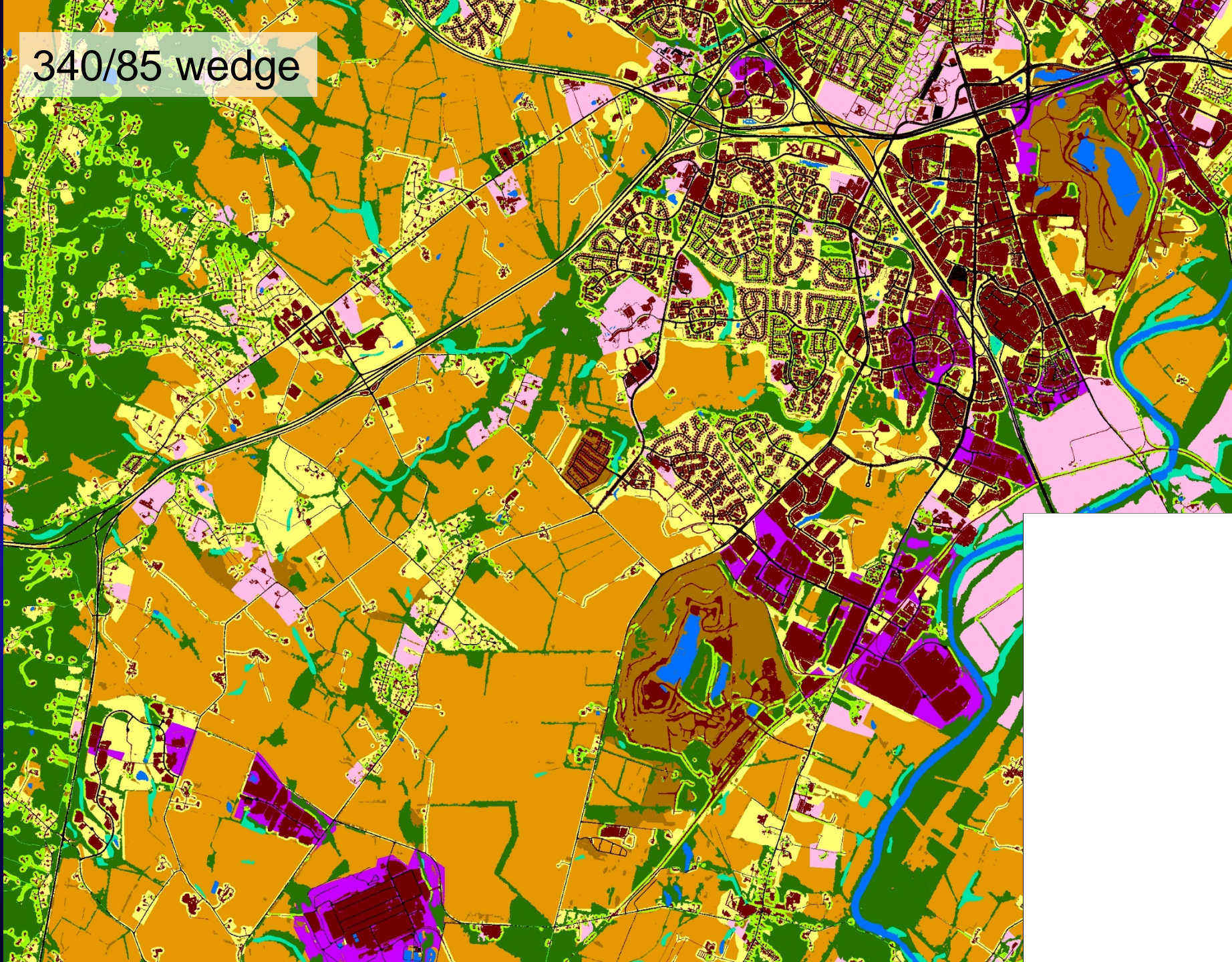


340/85 wedge





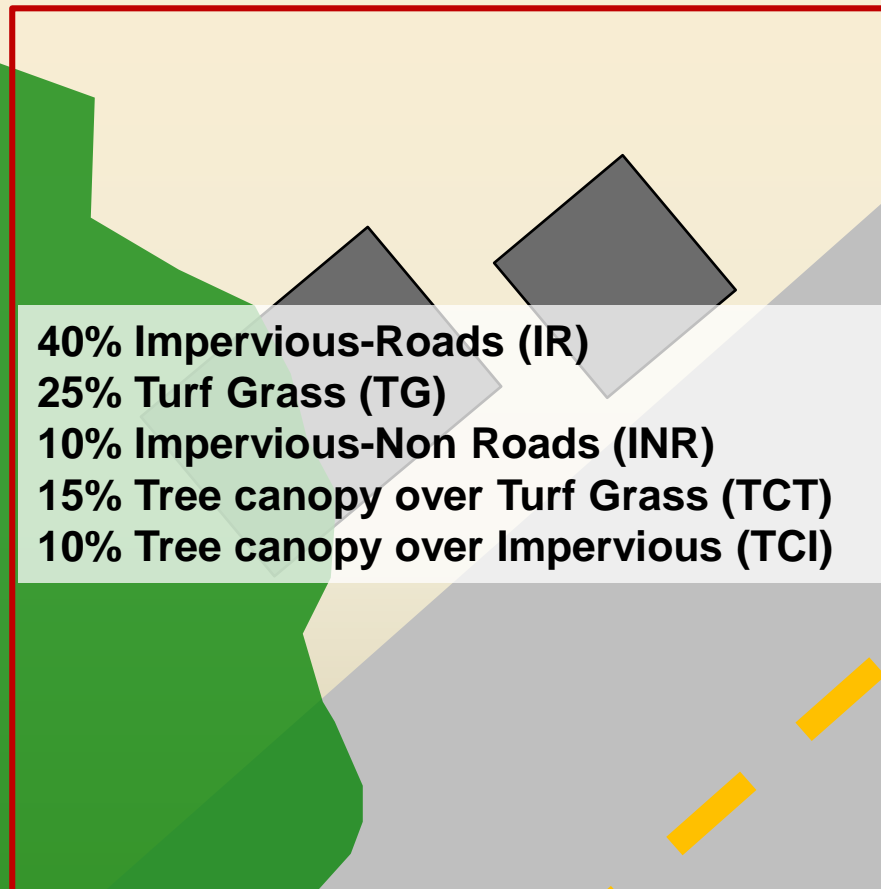
340/85 wedge





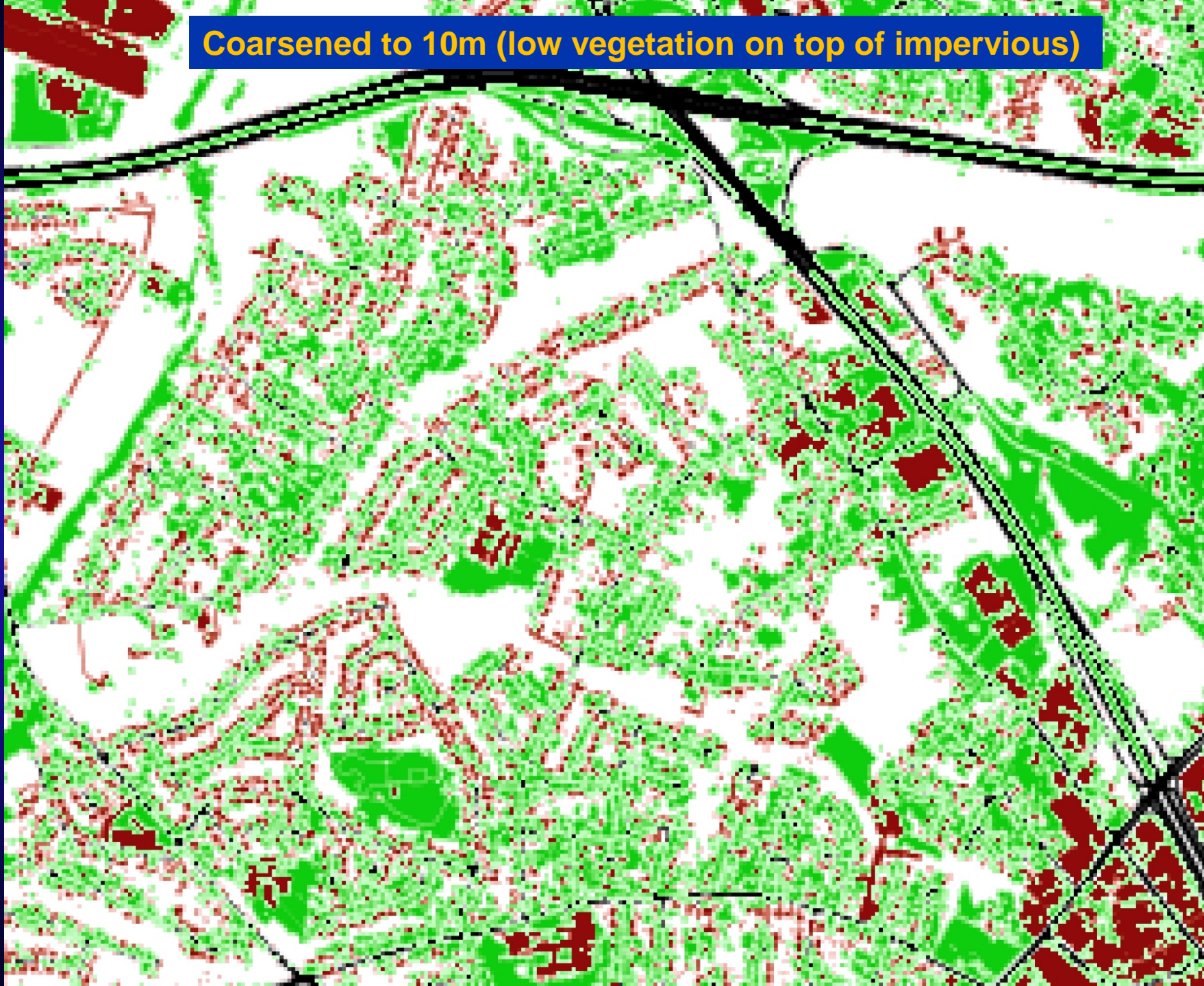
## Phase 6 Land Use Database – from local & high-res data

- Thirteen different 10m resolution raster datasets
- Each cell includes the fractional composition of all land uses.





Coarsened to 10m (low vegetation on top of impervious)





# Options for Updating Phase 6 Land Use Database

## 1. Only update areas of change from 2013 – 2019.

- Pros: Least expensive option.
- Cons: Temporal imprecision and errors in 2013-ish land use/cover classification persist in 2018/19 dataset.

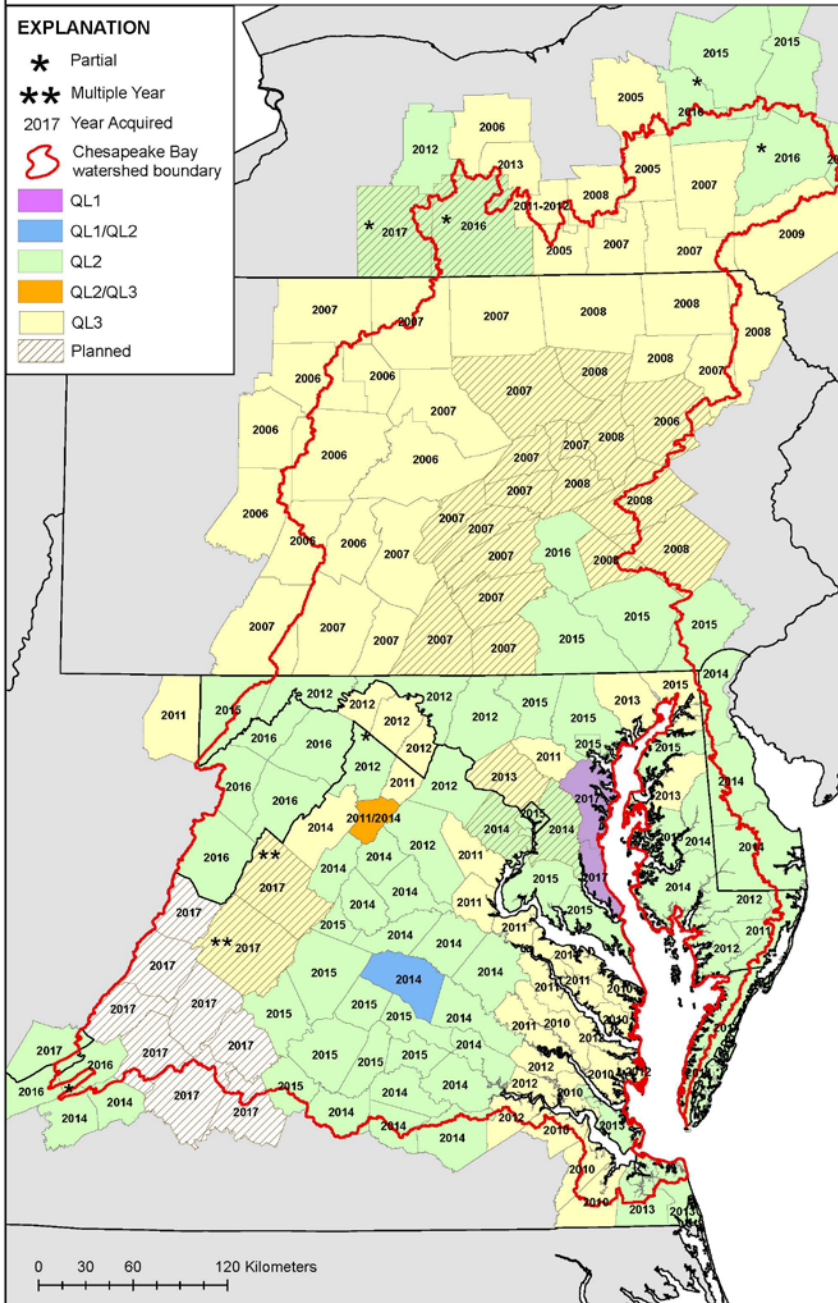
## 2. Remap watershed counties for 2018/2019 using NAIP and stereo imagery-derived Digital Surface Model. Update 2013 dataset based on change analysis.

- Pros: Errors in 2013 dataset can be fixed. More flexibility to improve classification using spectral and surface elevation data in addition to contextual analyses and use of ancillary data.
- Cons: More expensive and time consuming option.

## 3. Remap watershed counties for 2019 using specially acquired imagery and Digital Surface Model. Update 2013 dataset based on change analysis.

- Pros: Higher quality imagery will improve class accuracy, temporal precision, and automation of product. Errors in 2013 dataset can be fixed. More flexibility to improve classification using spectral and surface elevation data in addition to contextual analyses and use of ancillary data.
- Cons: Most expensive option.

# Chesapeake Bay Watershed Lidar Data by County, January 2018



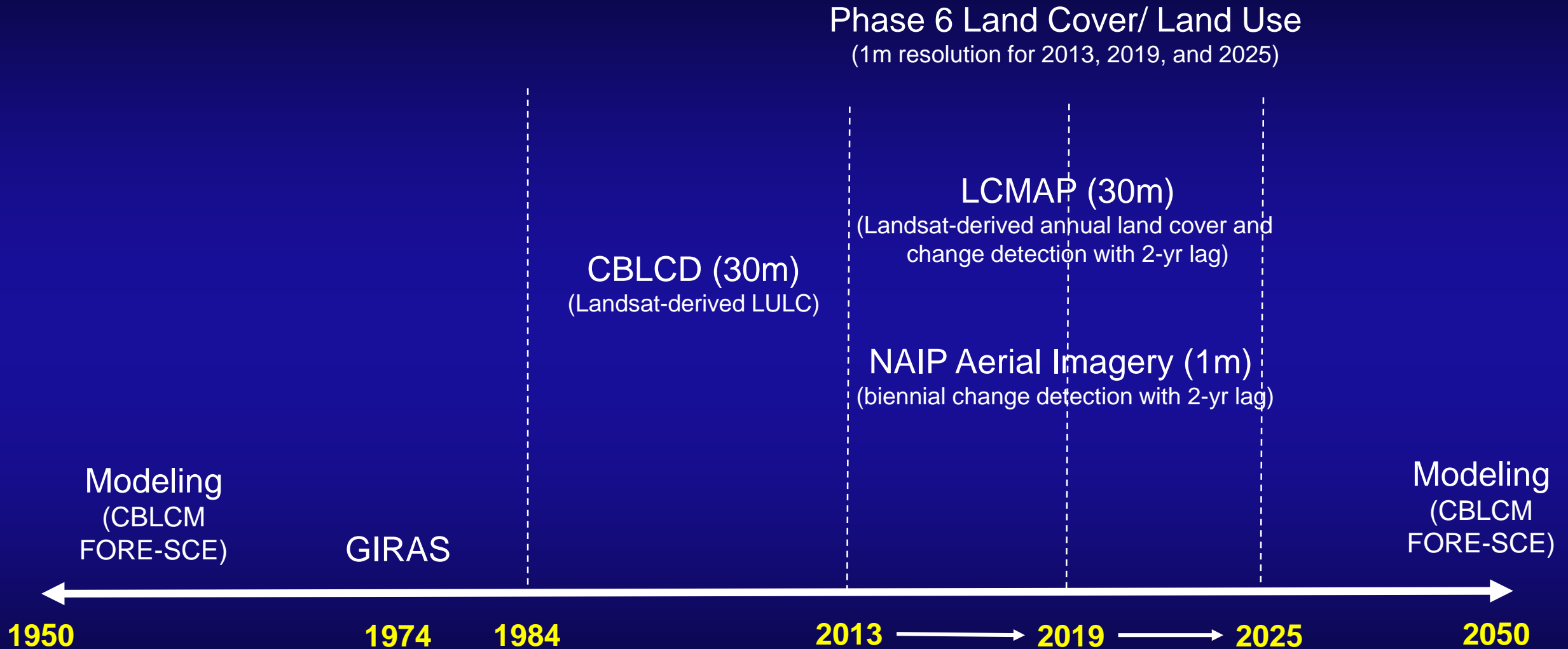


# Why monitor and map land cover / land use?

- Verify/validate land use planning and conservation BMPs in Phase III WIPs
- Fulfill “Land Use Methods and Metrics Outcome” in 2014 Chesapeake Bay Agreement.
- Improve parameterization of land change models used to inform restoration and conservation activities.
- Inform understanding of water quality trends.



# Monitoring & Modeling Land Cover/Use Change





## Availability of NAIP Aerial Imagery

Year	Delaware	Maryland	New York	Pennsylvania	Virginia	West Virginia
2009	4-band	4-band	3-band		3-band	3-band
2010				4-band		
2011	4-band	4-band	4-band		4-band	4-band
2012					4-band	
2013	4-band	4-band	4-band	4-band		
2014					4-band	4-band
2015	4-band	4-band	4-band	4-band		
2016					4-band	4-band
2017	4-band	4-band	4-band	4-band		
2018					Planned?	Planned?
2019	Planned?	Planned?	Planned?	Planned?		



# Feedback Requested from CBP GITs

1. Express opinion on Phase 6 land cover/ land use update options.
2. Suggest changes to the classification schema.

Land Cover



Land Use

