Revising the Land Use History for the Chesapeake Bay Watershed

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Overview

- Goal:
  - Build a temporally, spatially, and categorically detailed historical land use database from the mid-1980's to present at the parcel scale

- Purpose:
  - Improve the calibration of the next generation watershed model, Phase 7
  - Better understand the impacts of changes in land use and Best Management Practices (BMPs) on water quality from models such as SPARROW and SWAN

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What Data Will be in the Database?

- Every parcel and road segment will contain a land use for every 3-5 year period from 1985-2021

- Potential Back-Casted Land Uses are yet to be determined but the following are suggested:

Impervious Roads (IR)
Impervious Non-Roads (INR)
Tree Canopy over Impervious (TCI)
Turf Grass (TG)
Tree Canopy over Turf Grass (TCT)
Construction (CON)
Tidal Wetlands (WLT)
Floodplain Wetlands (WLF)
Other Wetlands (WLO)
Water (WAT)

Forest (FORE)
Other Tree Canopy (OTC)
Harvested Forest (HAR)
Natural Succession (NS)
Suspended Succession (SS)
Extractive (EX)
Cropland (CRP)
Pasture (PAS)
Animal Operations (AO)

What Historical Data is Available?

Historical Land Use Raster Data (1-meter Resolution)

> **High-Resolution Land Use**
> 2013/2014, 2017/2018, 2021/2022

Extent covers 206 counties Intersecting the Chesapeake Bay Watershed

Historical Land Cover Raster Data (30-meter Resolution)

> **LCMAP**
> 1985-2019

> **NLCD**
> '01, '04, '06, '08, '11, '13, '16 , '19

> **LANDFIRE**
> '01, '08, '10, '12, '14, '16, '19*

> **Chesapeake Bay Land Cover Data Series**
> 1984, 1992, 2001, 2006

* Limited LANDFIRE update
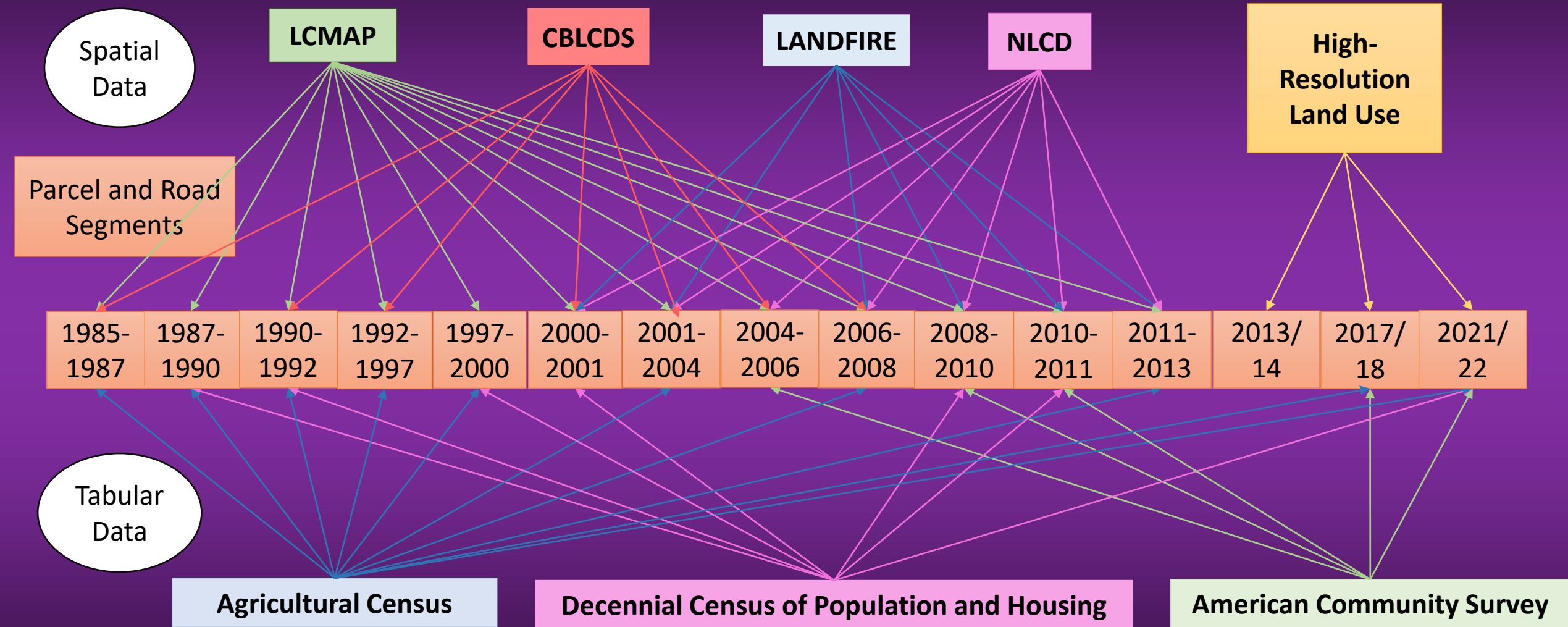** Extent covers Chesapeake Bay Watershed only

Historical Tabular Data

> **Agricultural Census**
> Every 5 years

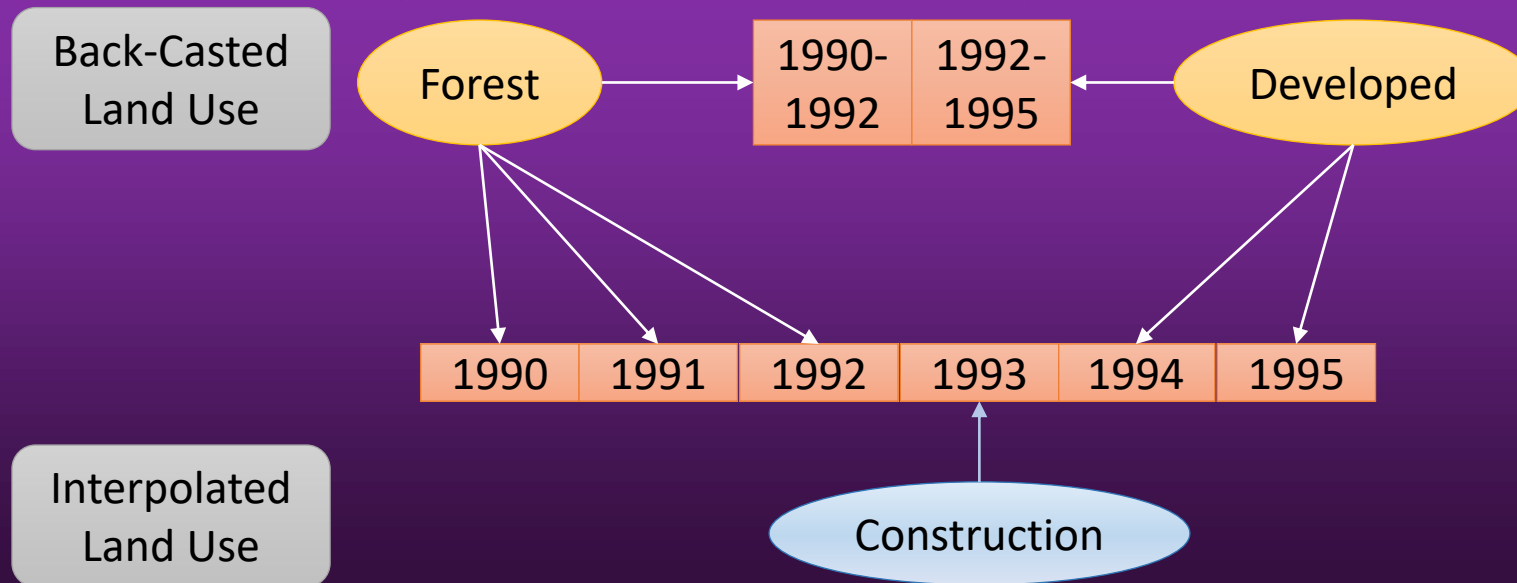> **Decennial Census of Population and Housing**
> Every 10 years

> **American Community Survey**
> Annually starting in 2005

LCMAP: Land Cover Monitoring, Assessment and Projection
NLCD: National Land Cover Dataset

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How is the Landscape Deconstructed?

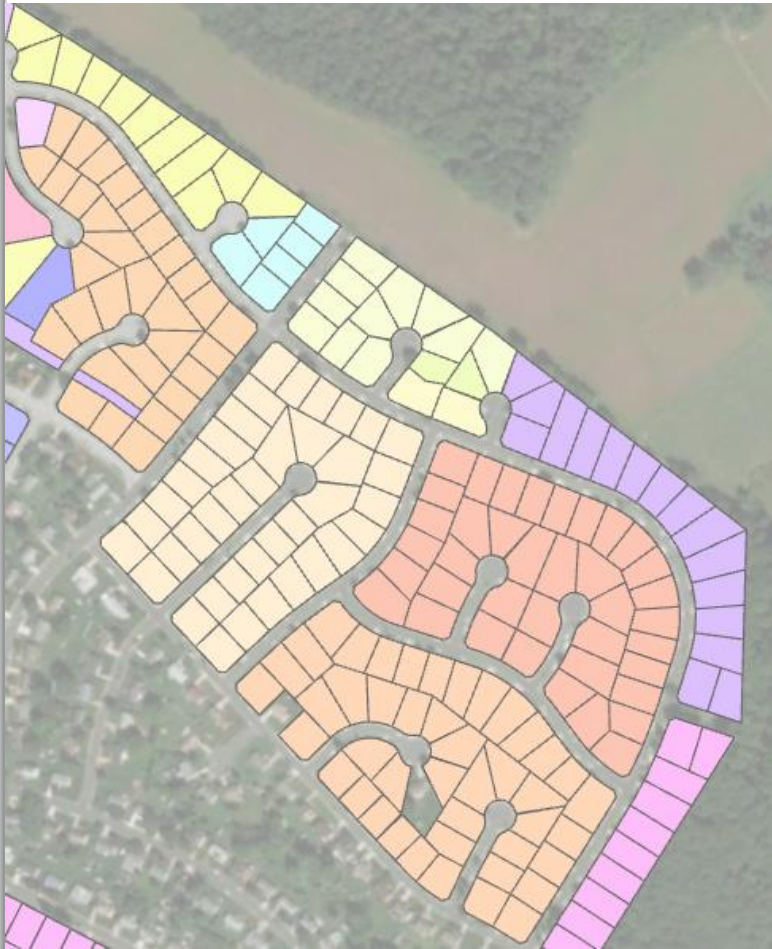CBLCDS: Chesapeake Bay Land Cover Data Series

How is the Landscape Deconstructed? (Cont.)

- The time periods will be selected to ensure multiple datasets inform each bracket of time

- To produce an annual deconstruction, land use will be interpolated for each time period
  - Land uses will remain consistent if the following time period contains the same land use
  - Rules will be developed to interpolate time periods where a change occurred

Back-Casting Development

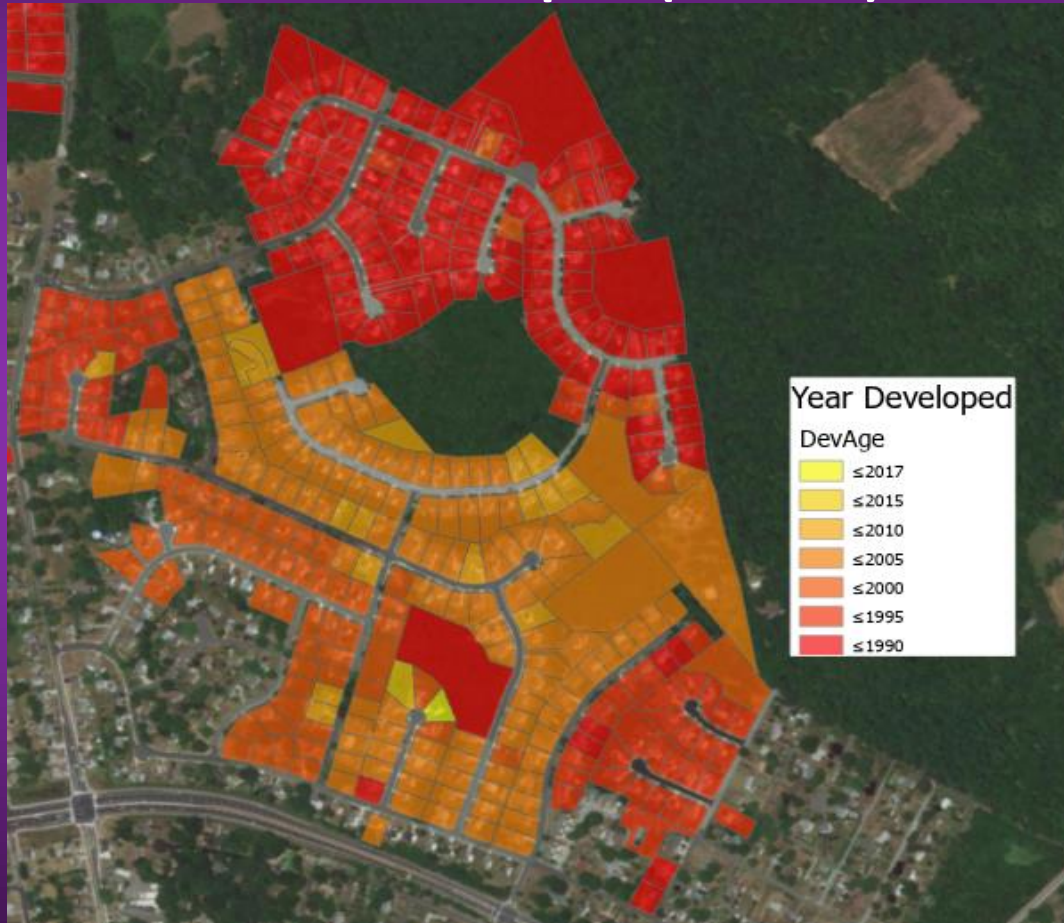Residential parcel grouping example, before association to roads is applied

- Residential parcels on the same block/cul-de-sac are grouped together based on their size and association to the same road

- All parcels and residential parcel groups are assigned the available land cover, land use and tabular data

- Use rules (based on available data) to classify land use
  - Parcels whose data is insufficient (due to resolution of spatial data and small parcel size) will be assigned its groups' land use
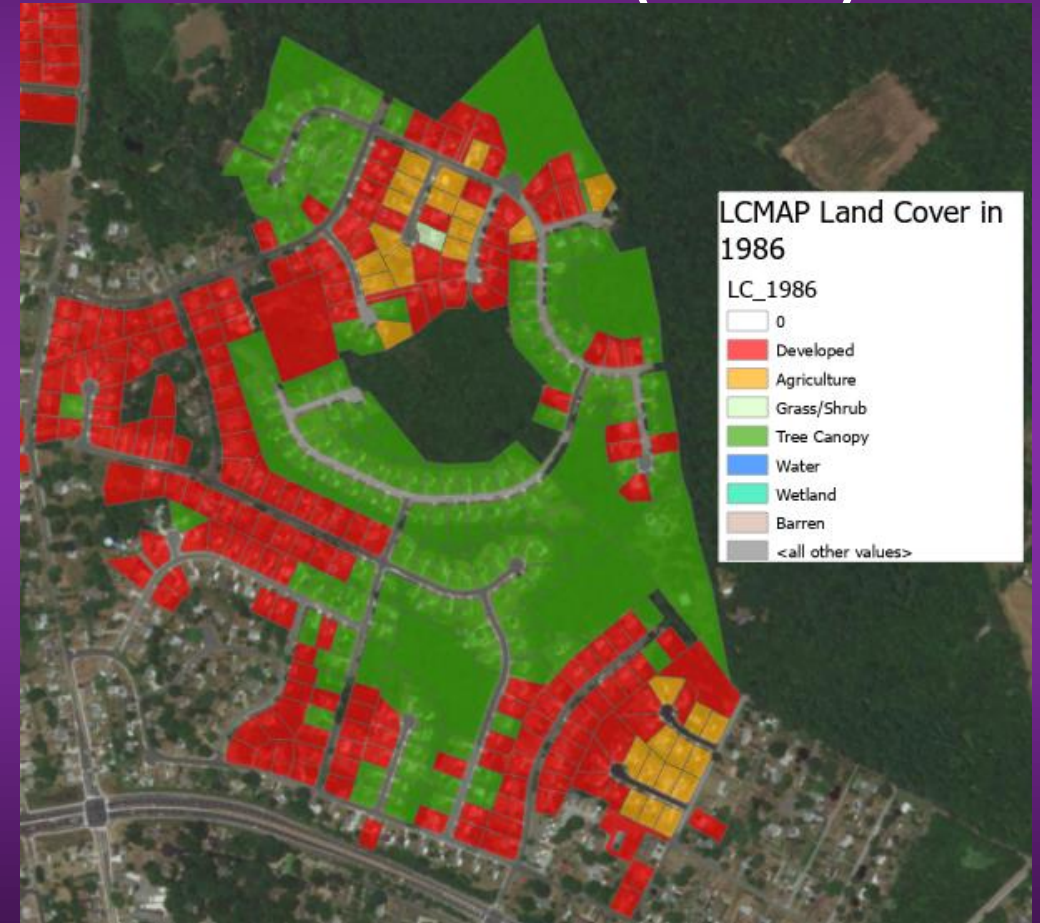
Back-Casting Development Example

Year Developed (LCMAP)

Land Cover 1986 (LCMAP)

Summary

- Using a combination of historical land cover and land use spatial data and historical tabular data, a temporally and spatially explicit fine-scale land use database can be built from the mid 1980s to present

- This database can be used to calibrate Phase 7 at the NHD+ scale (if decided) and in models like SPARROW and SWAN with no downscaling required.

Contact

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