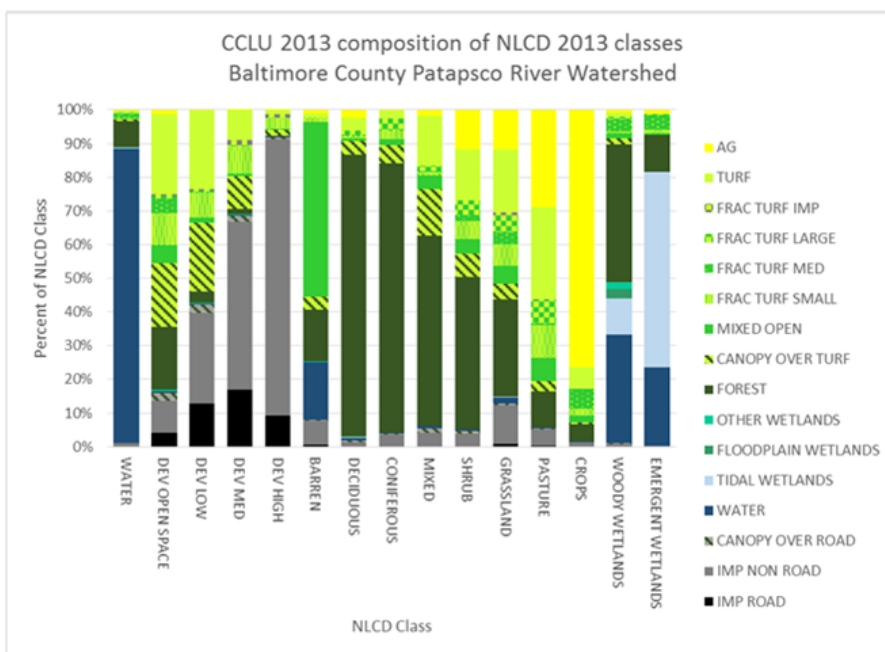


## Backcasting Land Cover Approved Methodology<sup>1</sup>

If land use data covers a single date and a time series is desired, translation from a time-series LULC product to this product is necessary, or some other form of "back casting" the new LULC into the past. To achieve land use load change over time, as used in prior TMDL IP work, Baltimore County relied on NLCD (2001-2016) and CCLU (2013/2014). CCLU land use categories generally match the land uses MDE provided. The County used GIS analysis to develop a translation from NLCD land use categories to CCLU land use categories, based on NLCD 2013 and CCLU 2013, and applied the translation to relevant NLCD years (2016 for present, 2001 for Patapsco TSS TMDL baseline). A bar chart illustrating the translation is shown below:



Note that CCLU "fractional" land use classes go through a second translation step, dividing them into "singular" land uses following the [definitions of the CCLU fractional land use classes](#). As the bar chart shows, each NLCD land use class has a distinct CCLU composition, and these compositions appear to be reasonable. For example, NCLD Water is mostly CCLU Water; NLCD woody wetlands is a mixture of CCLU water, wetlands, and forest; NLCD DEV classes are mixtures of impervious, forest, tree canopy, and turf, and the impervious increase from DEV OPEN SPACE to DEV HIGH; NLCD CROPS is nearly all CCLU Ag; NLCD PASTURE is a blend of CCLU ag, turf, and tree canopy (distinguishing turf from pasture is a challenging remote sensing task). A full evaluation of the accuracy and suitability of this approach has not been performed. Our experience does show that this method is practical to implement. Two challenges remain, but should be surmountable given sufficient time:

- a. Pre 2001 GIS land use data. Options: NLCD 1992 (not designed to be perfectly comparable to NLCD 2001-2016), P5 CBWM land use data series (1984-2011), CAST tables. NLCD 1992 was used by Baltimore County in the past and might be the easiest solution. CAST tables might be

<sup>1</sup> Adapted from methodology provided by Baltimore County

used to evaluate and refine the accuracy of the translation results, but this idea remains to be explored.

- b. Incorporation of 1m or higher resolution land cover data into NLCD land use (30m pixels). The County has previously used planimetric impervious surface GIS data from multiple dates to add high spatial resolution impervious cover. This provides a high spatial accuracy for the single most important urban land cover (from a nutrient and sediment pollution load perspective). Similar work could be done for P6 GIS land use data purposes.