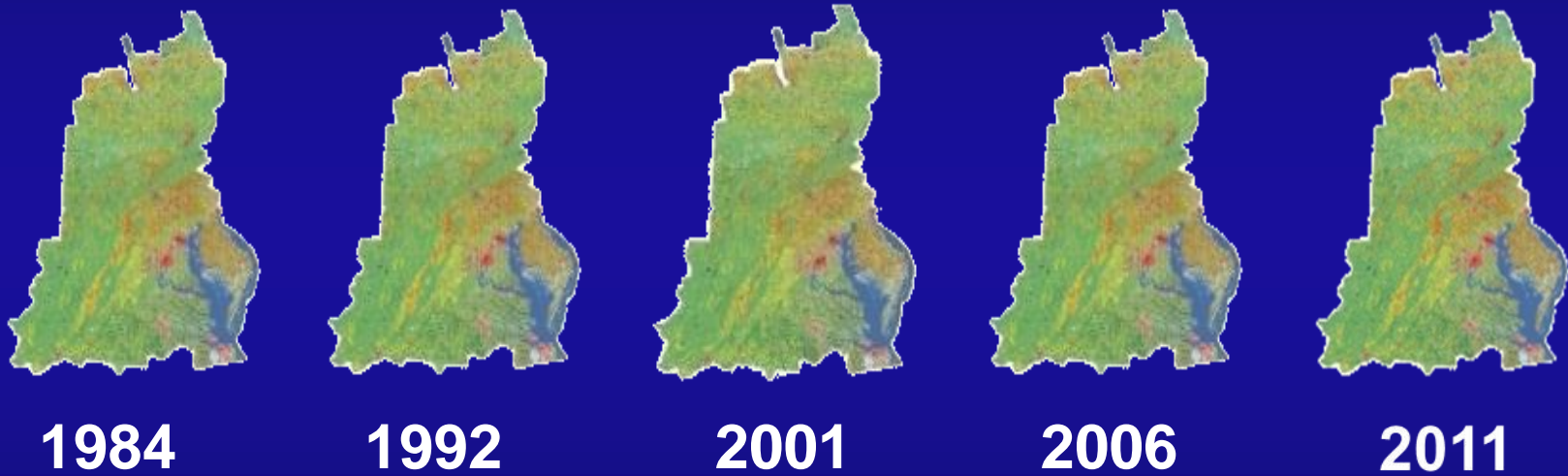




The Chesapeake Bay Land Cover Data Release 2011 Edition (CBLCD e11)



Frederick Irani
USGS Eastern Geographic Science Center

Outline: CBLCD 2011 Edition

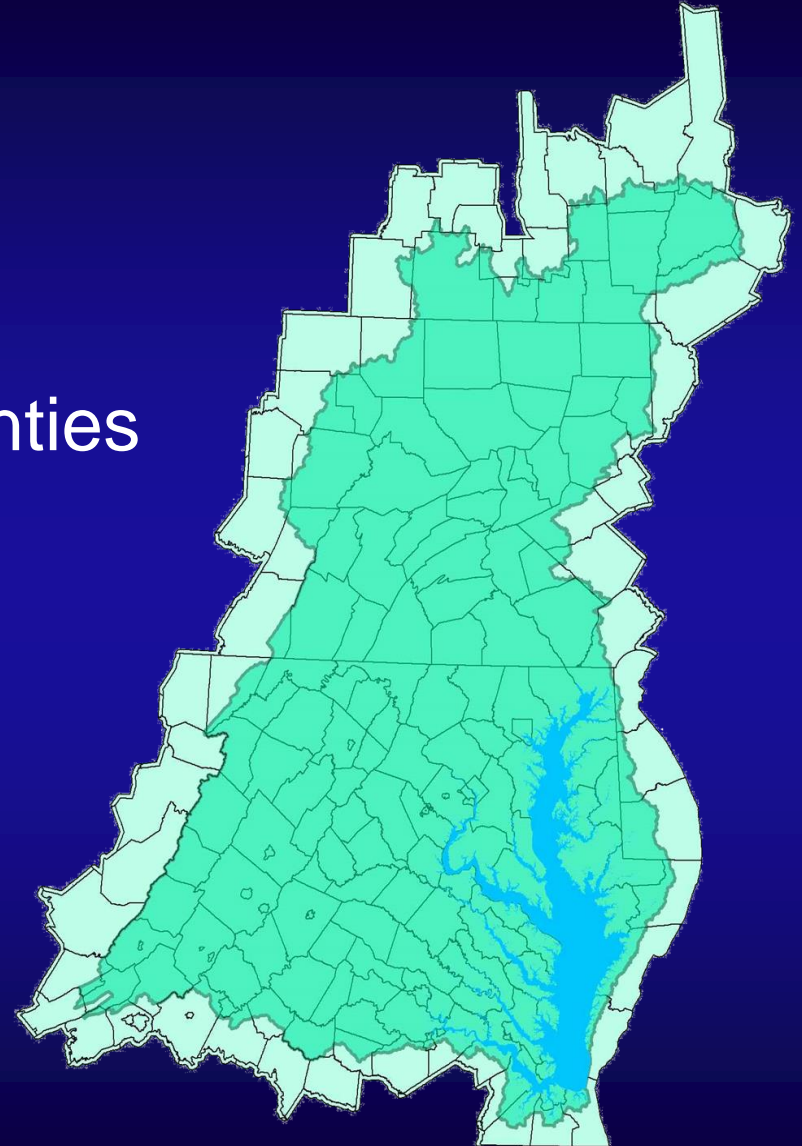
- Purpose
- CBLCD History
- Process
- Result
- Release

Purpose: CBLCDe11

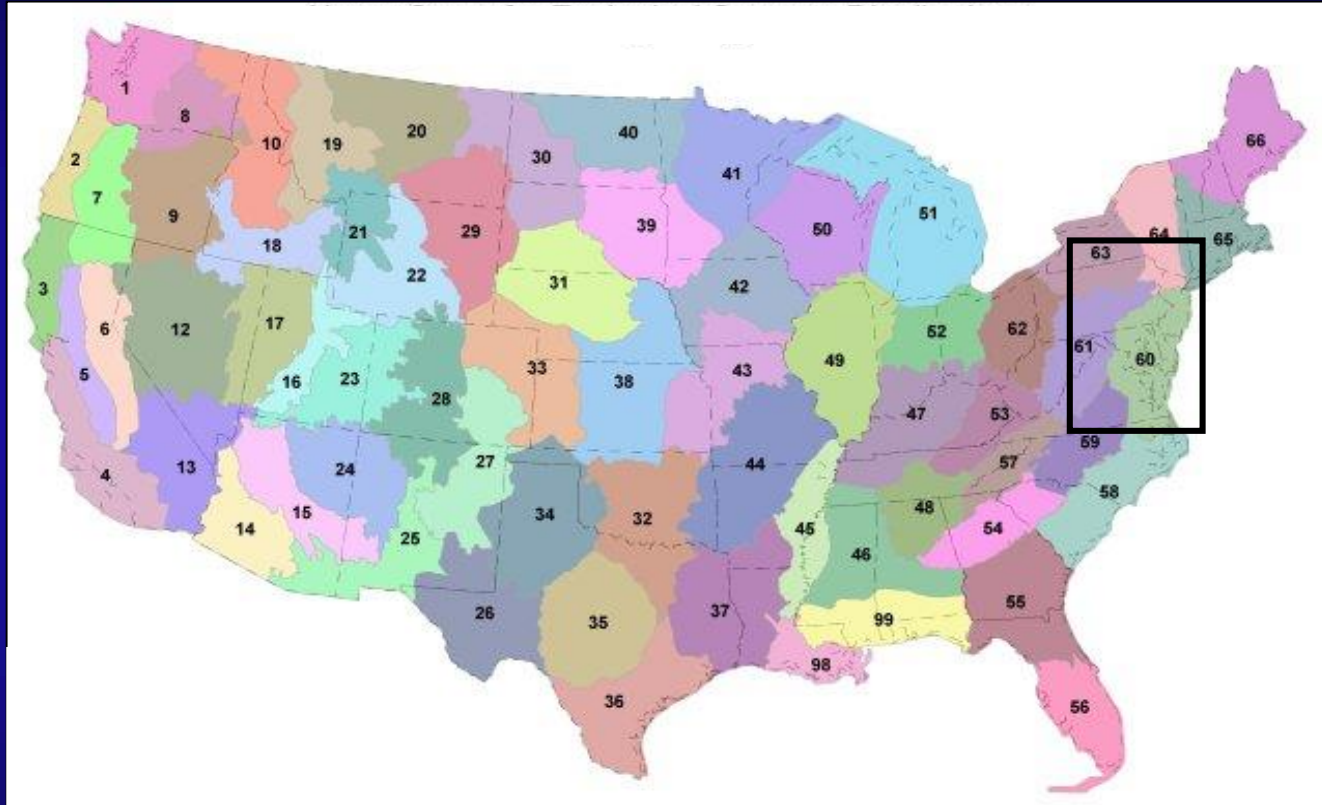
- **Help to Delist CB From EPA National Impaired Waters List**
- **Provide a Temporarily Comparable Spatial Land Cover Record**
- **Extend the Existing CBLCD 2010 USGS Release to Include 2011**

History: CB Study Area

Study area =
CB watershed
+ All of Intersecting Counties

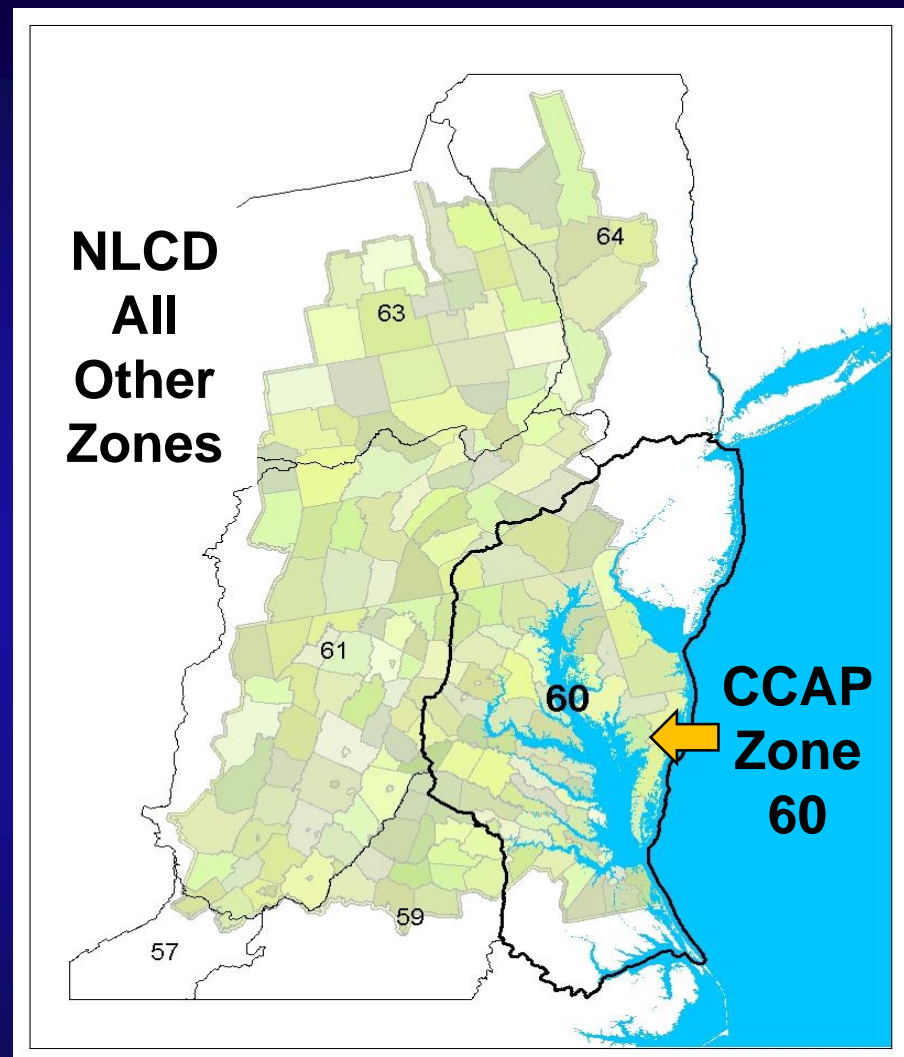


History: MRLC Mapping Zones



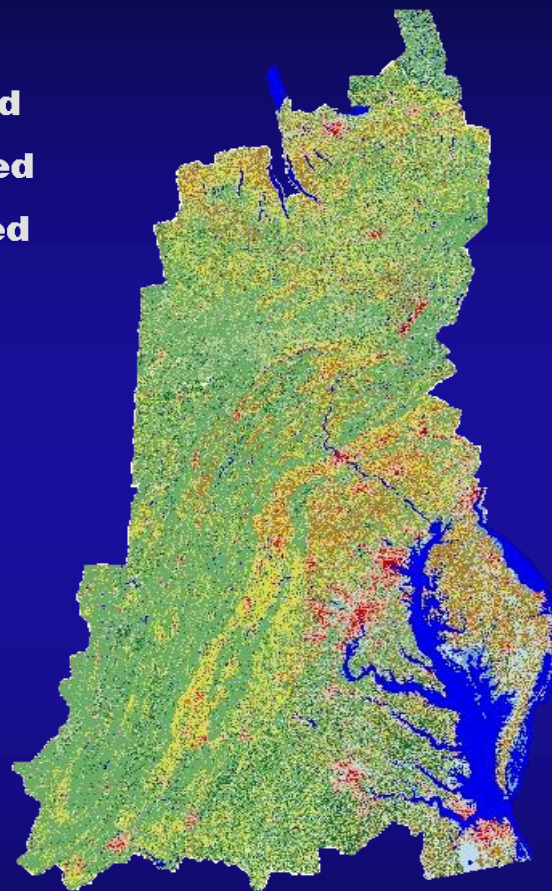
History: CBLCD 2001 Base Map

- Zone 60 from NOAA Coastal Change Analyses Program (CCAP)
- Remaining Zones from NLCD 2001
- Base Map for MDAF Corp. Process



History: CBLCD 2001 Base Map

16
Classes



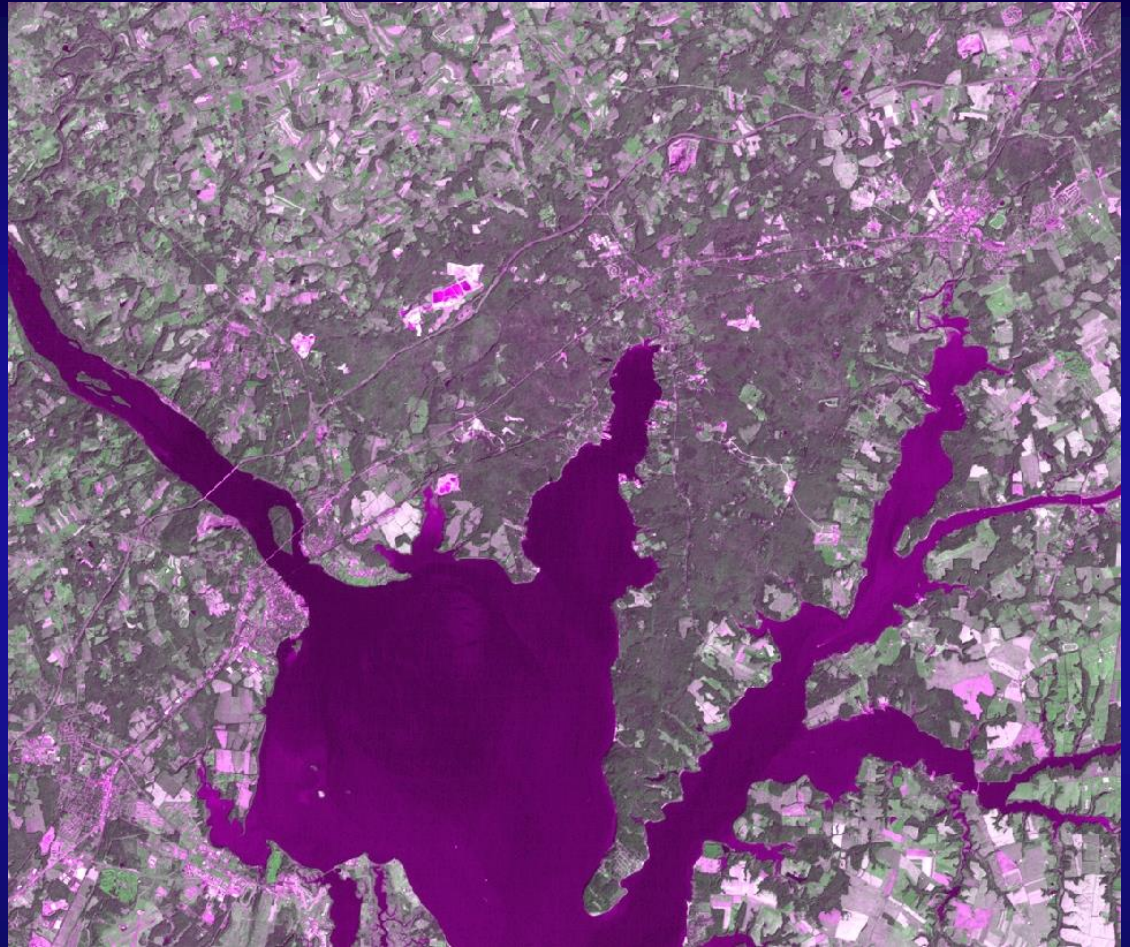
History: MDAF Cross Correlation

2001
Reflectance



History: MDAF Cross Correlation

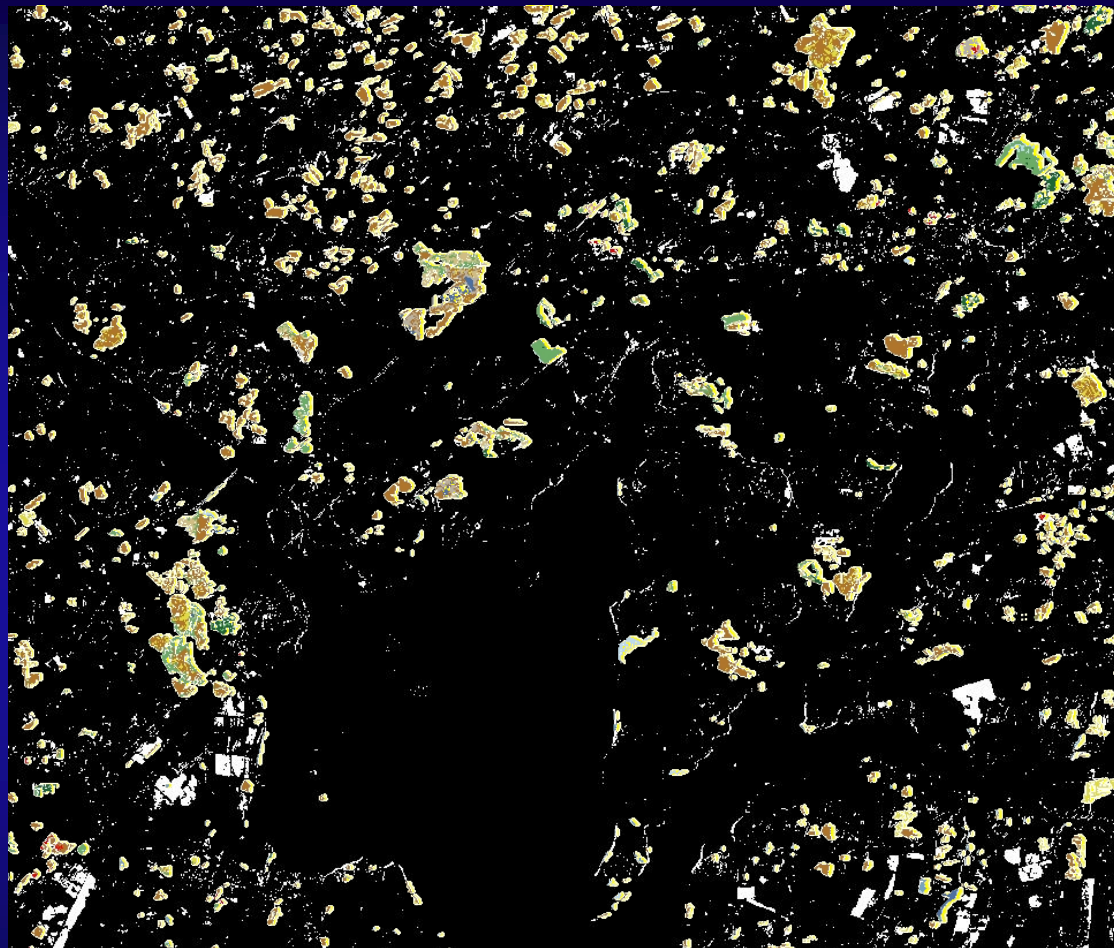
1992
Reflectance



History: MDAF Cross Correlation

Changed Pixels
Classified via
CART Analysis

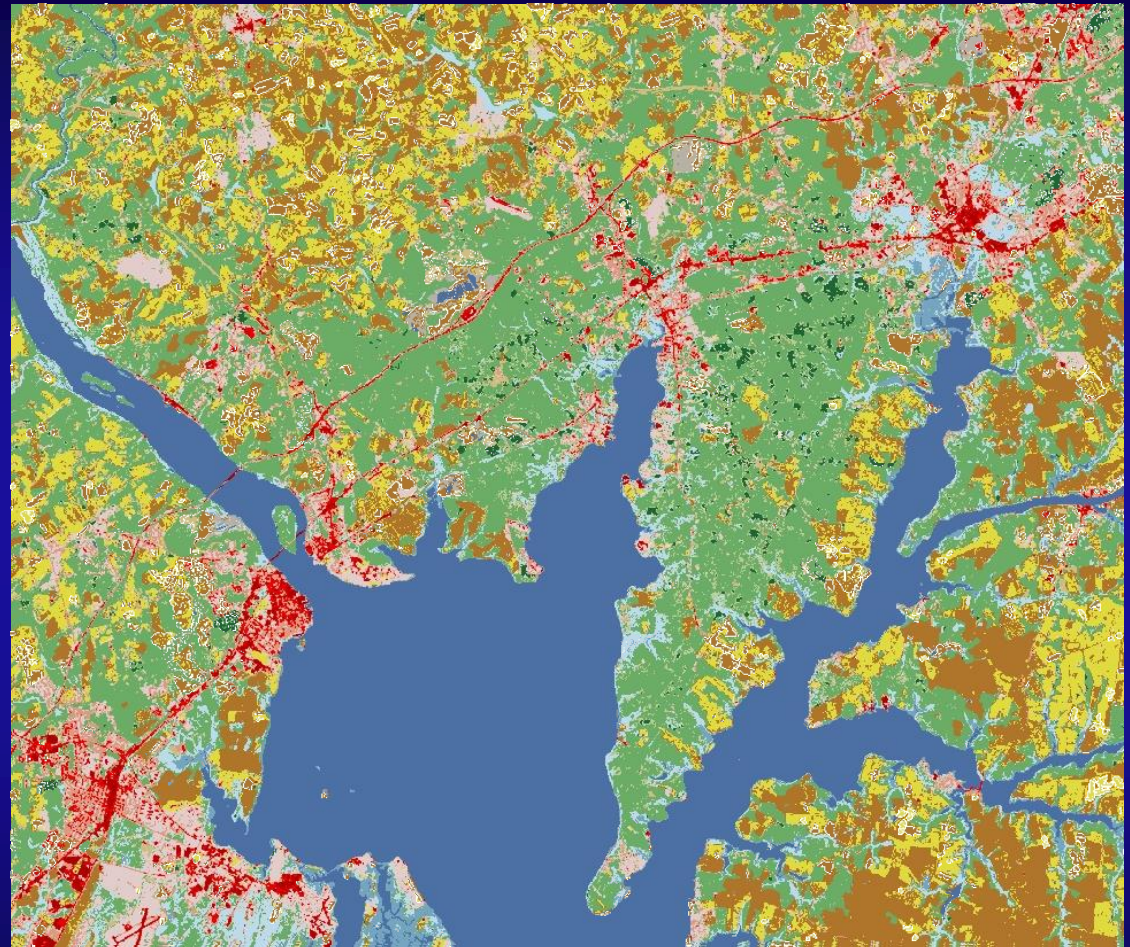
U.S. Patent No.
5,719,949
MDA Federal
Corporation



History: MDAF Cross Correlation

Only changed areas are
Classified and
burned in
to the Baseline
to create the
target year
land cover
dataset

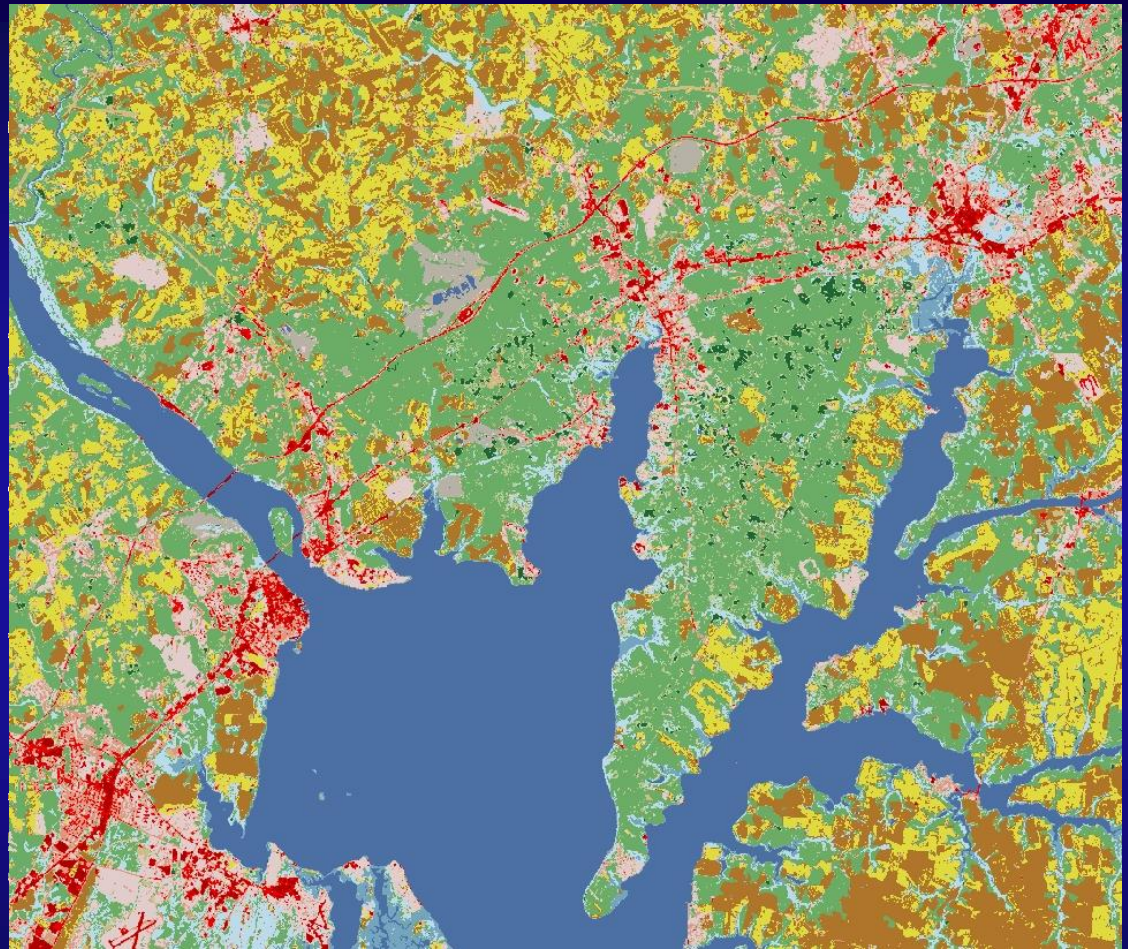
2002



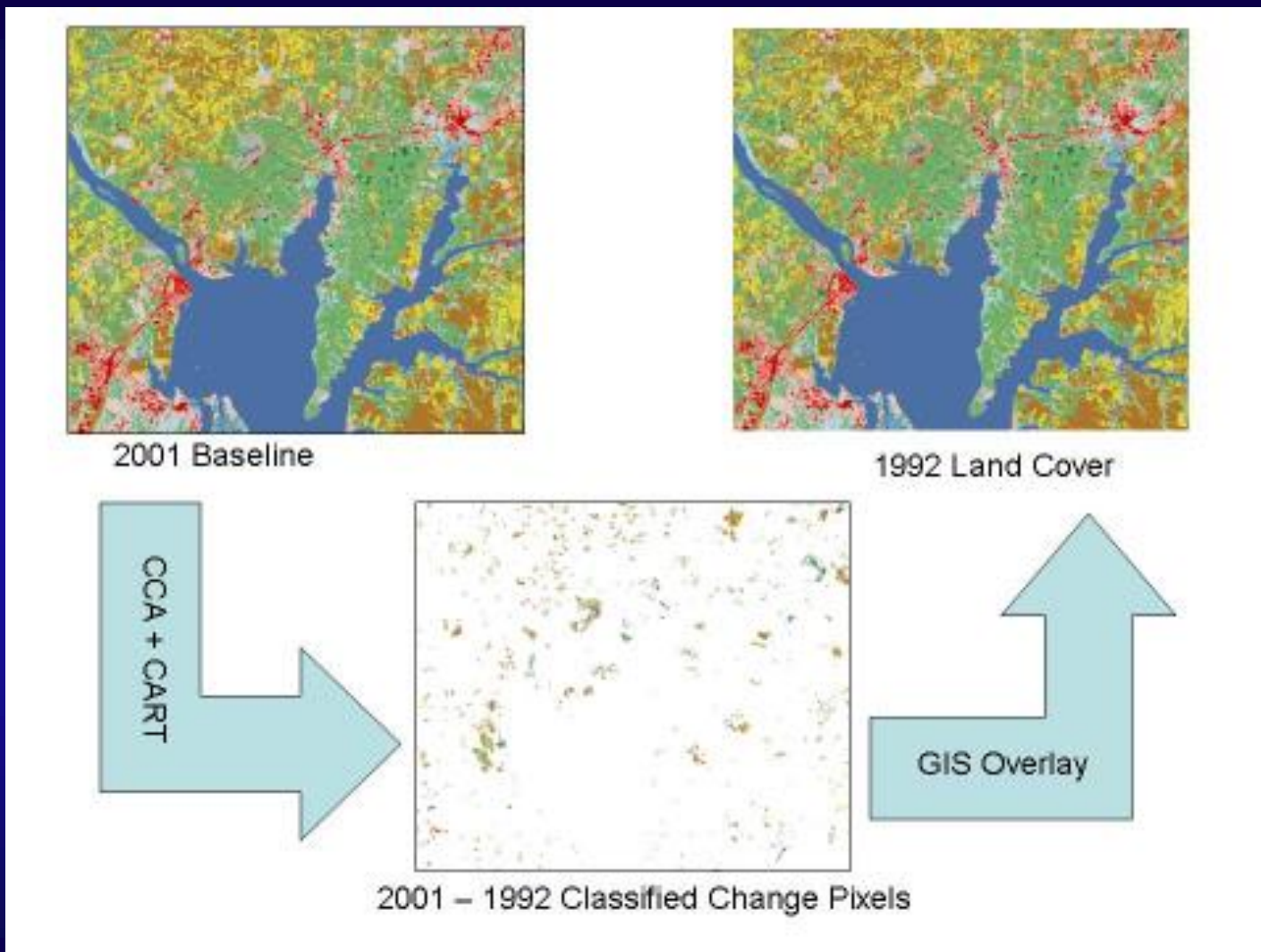
History: MDAF Cross Correlation

Only changed areas are
Classified and
burned in
to the Baseline
to create the
target year
land cover
dataset

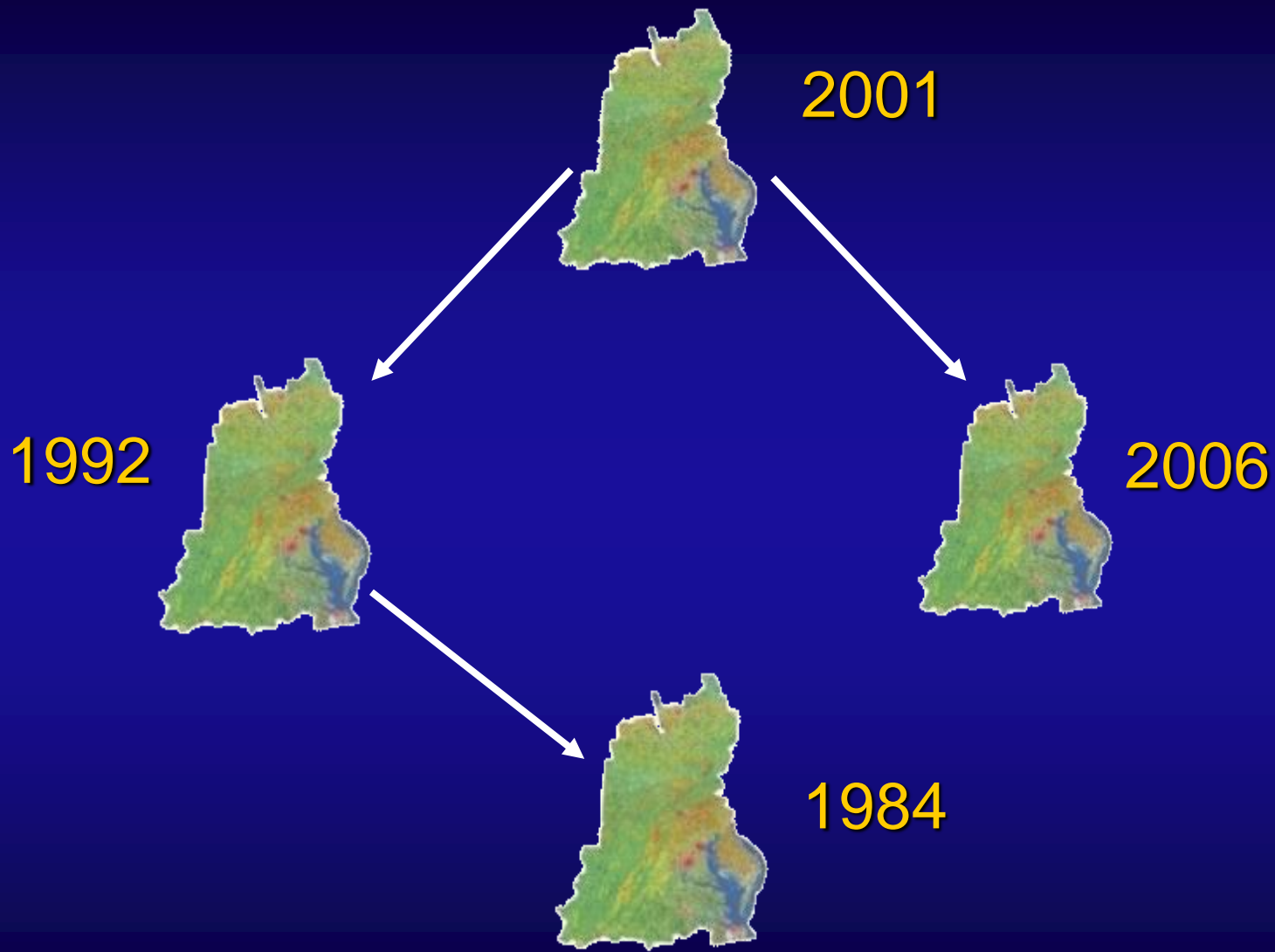
1992



History: MDAF Cross Correlation

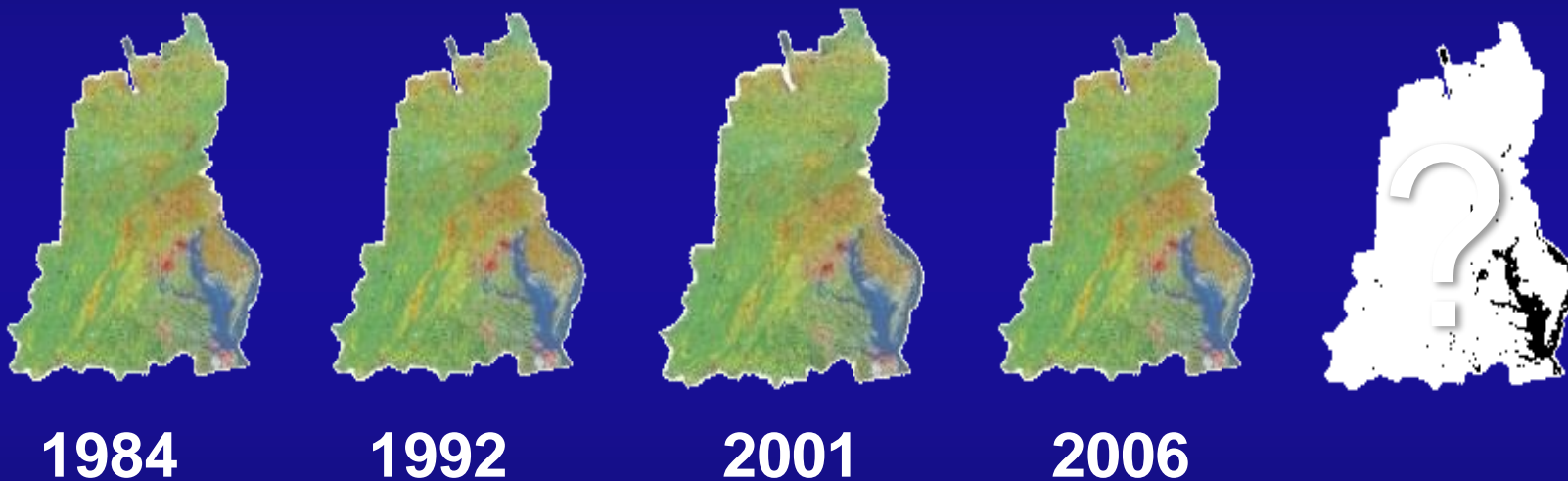


History: MDAF Cross Correlation



History: CBLCD

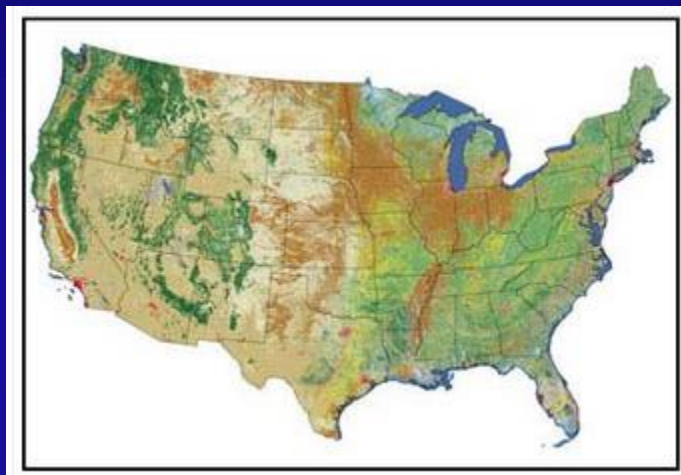
The USGS CBLCD Release Stopped at 2006
Cost ~ \$150K



Irani, F. M., & Claggett, P. (2010). Chesapeake Bay Watershed Land Cover Data Series. *US Geological Survey Data Series, 505*.

History: 2013 NLCD Edition 2011

http://www.mrlc.gov/nlcd11_data.php



2001, 2006, 2011

Jin, Suming; Yang, Limin; Danielson, Patrick; Homer, Collin; Fry, Joyce; and Xian, George, "A comprehensive change detection method for updating the National Land Cover Database to circa 2011" (2013). *USGS Staff -- Published Research*. Paper 711. <http://digitalcommons.unl.edu/usgsstaffpub/71>

Process: Evaluate NLCD 2011

- Minor Roads Problematic
- No Unconsolidated Shorelines (CCAP Class)
- Inter/Intra Class Confusion with CBLCD e.g.
 - Developed (DOS, LID, MID, HID)
 - Forest: (DF, EF, MF)
 - Agriculture (CC, PH)
 - Woody Wetland and Forest
 - Shrub/Scrub and Grassland Herbaceous

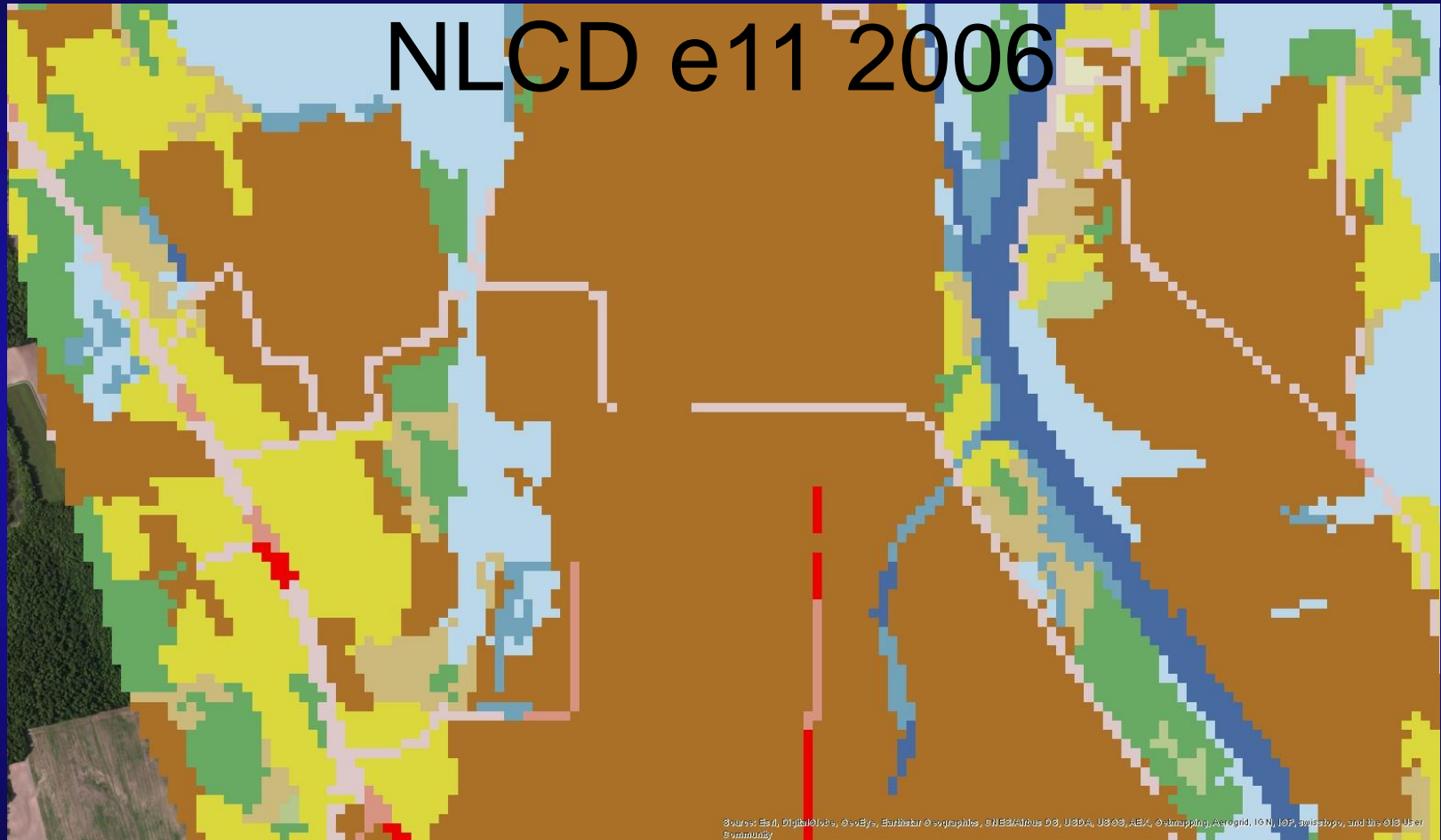
Process: Reduce NLCD Roads



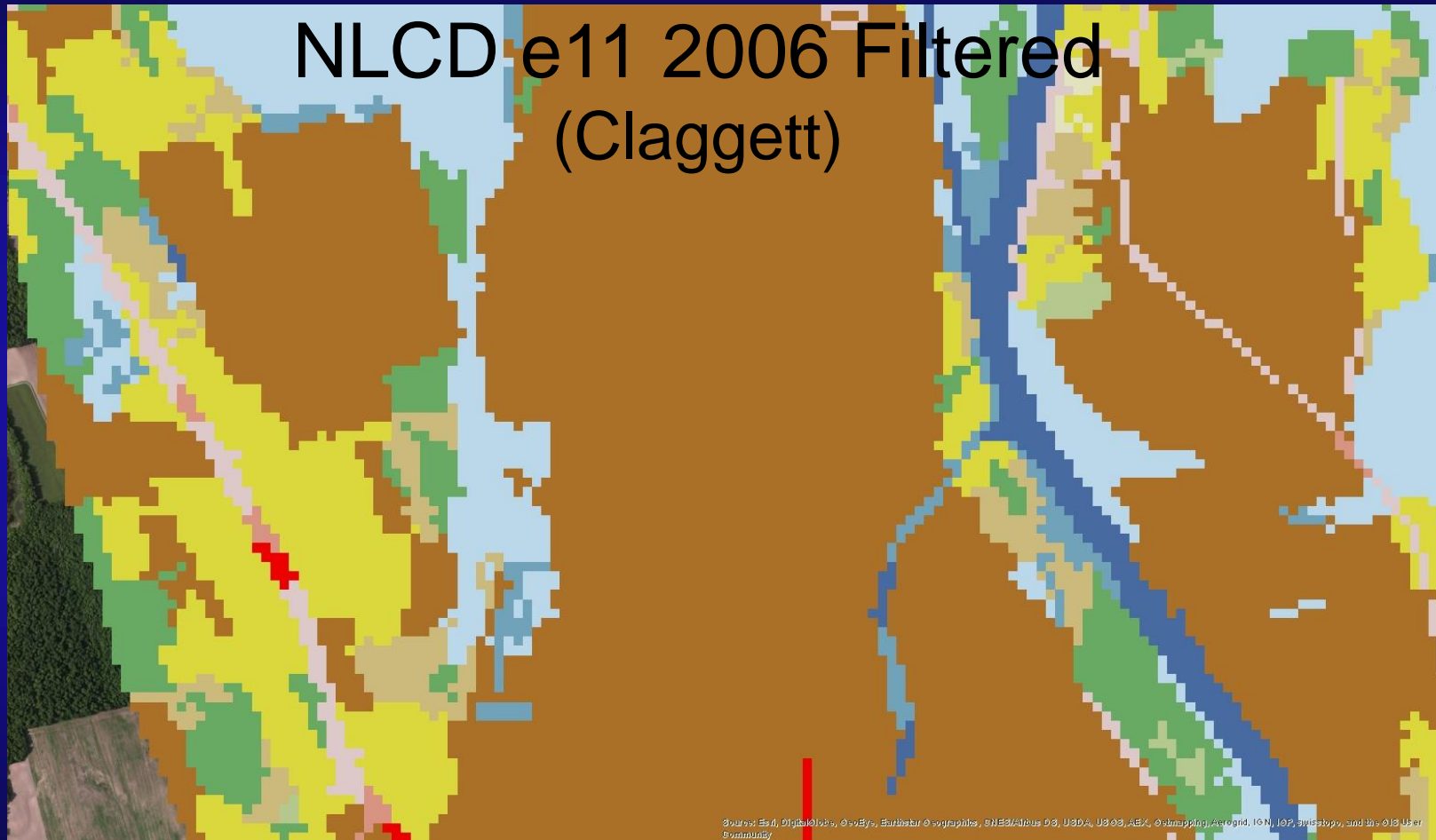
Process: Reduce NLCD Roads



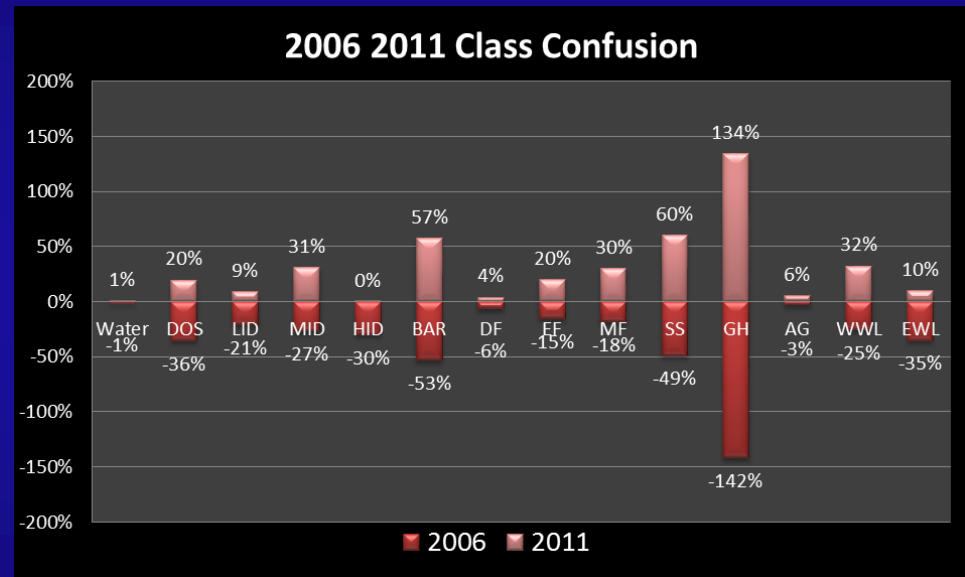
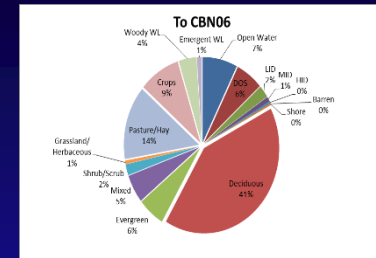
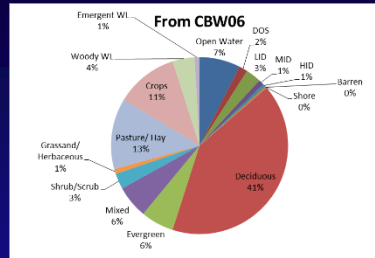
Process: Reduce NLCD Roads



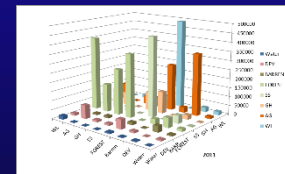
Process: Reduce NLCD Roads



Process: Identify Problematic Classes



Sum of Counts From 2006	To 2006	II	21	25	30	42	43	75	80	EVL	Total 2006
Value	DOB	DEV	EBAR	EF	MF	DF	AG	SS	WWL	EWL	
Water	2032096	7474	9338	6760	49817	8530	763	740	6713		2150247
DOS	814	207288	2094	1376	8811	8961	3508	1956	788		432330
LID	23940	4211	882463	2921	30994	20094	62793	30303	2833		5230678
MID	2893	24778	18874	82847	5450	8889	75207	2710	2720		1063467
HID	37978	27971	24793	11311	161888	161888	35444	47846	26127		8734037
BAR	8078	8	2702	2075	805843	1682058	1682058	2785	8877		17434076
DF	36986	220562	95243	29263	232051	50742	698889	69202	56244		10665688
FF	50862	27849	87888	19527	16834	34952	42872	165924	2913		7529848
MF	6277	8268	844	308	12628	5464	3021	6543	33288		120784
SS	21453373	5124396	10373889	1833368	14830437	16778225	18378547	68326744	3287372		2082527
Total 2006	2102247	432330	5230678	10665688	17434037	698889	17434037	698889	7529848	2150247	
Diagonal	2133338	3787393	11897407	675473	34289352	34562093	8858887	66537874	2372369		
2011 Confusion (Percent 2006)	-2027.777	-1346.913	-1476.678	-358.035	-5493.175	-2217.126	-3519.740	-1388.180	-834.603		
Confusion	-1.3351	-39.5801	-32.4831	-53.8191	-3.8951	-35.2331	-51.3231	-2.3931	-36.1731		
Pct Total	989398	-28.2361	-11.8331	-34.6431	-3.7891	-13.2761	-33.1931	-2.3891	-28.6291		
Percent Difference	888334	13.38%	87.83%	97.86%	88.62%	86.24%	88.34%	97.84%	12.00%		
Total 2011	688438	183368	299289								



Process: Collapse Classes



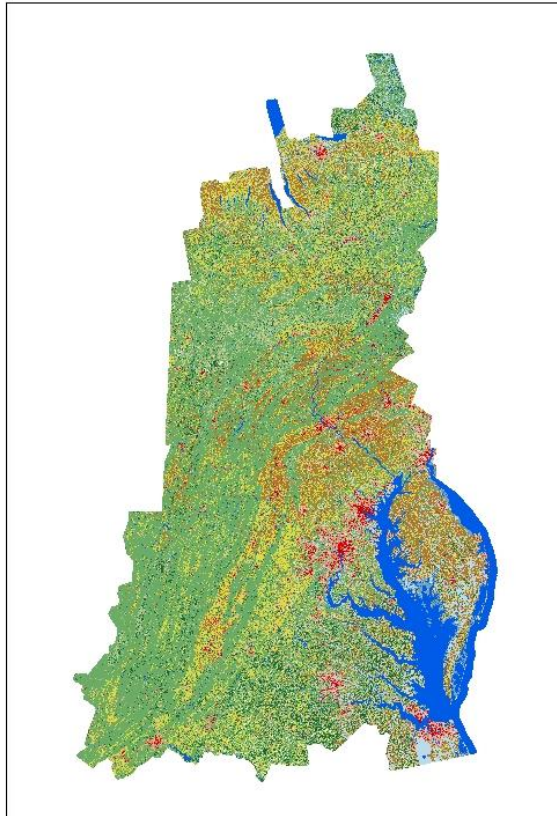
16

CBLCD 2010 Release		CBLCD Edition 2011
11 – Water	→	11-Water
21 – Developed Open Space (DOS)	→	Developed Open Space
22 – Low Intensity Developed	→	25-Developed Other
23 - Medium Intensity Developed	→	
24 - High Intensity Developed	→	
31 – Barren	→	30-Barren
32 – Unconsolidated Shore	→	
41 - Deciduous Forest	→	40-Forest
42 – Evergreen Forest	→	
43 – Mixed Forest	→	
52 - Shrub/Scrub	→	50-Grassland/Shrub
71 – Grassland/Herbaceous	→	
81 - Pasture/Hay	→	80-Agriculture
82 – Cultivated Crops	→	
90 – Woody Wetlands	→	95-Emergent Wetlands
95 - Emergent Wetlands	→	

8

Process: Collapse Classes

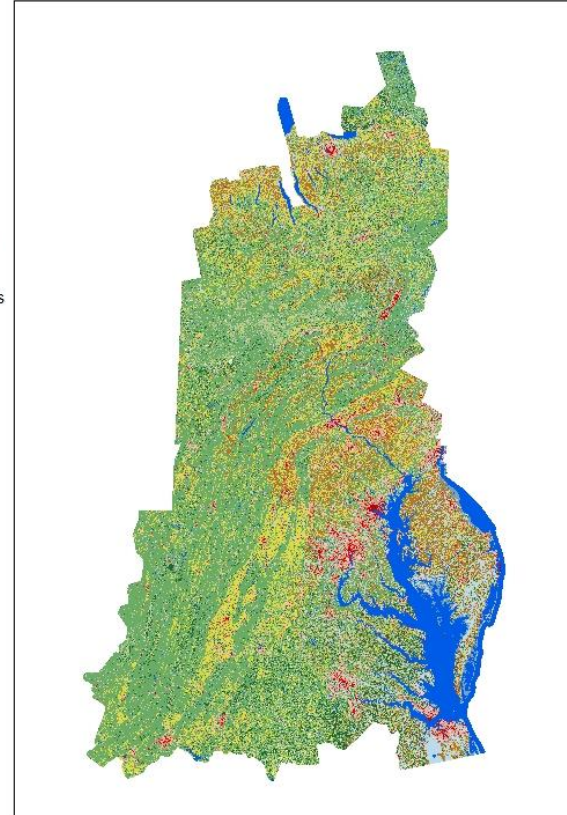
NLCD 2011 Edition '01, '06, '11



16 Classes

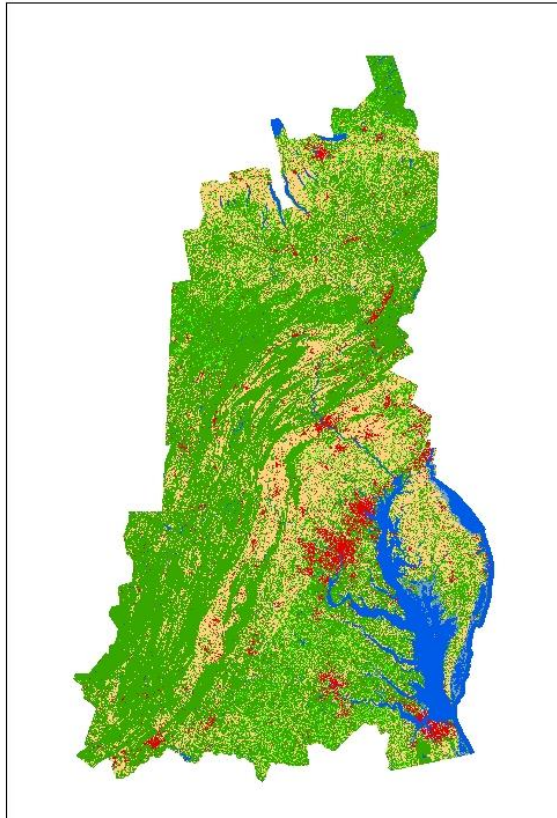
- Open water
- Developed open space
- Low intensity developed
- Med. intensity developed
- High intensity developed
- Barren
- Unconsolidated Shorelines
- Deciduous forest
- Evergreen forest
- Mixed forest
- Shrub/scrub
- Grassland/herbaceous
- Pasture/hay
- Cultivated crops
- Woody wetlands
- Emergent wetlands

CBLCD 2010 Release '84, '92, '01, '06

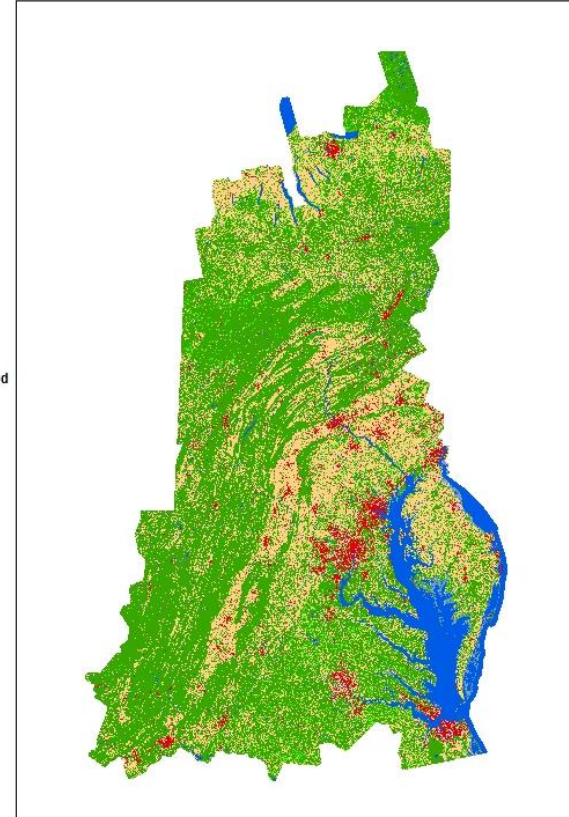


Process: Collapse Classes

NLCD 2011 Edition '01, '06, '11



CBLCD 2010 Release '84, '92, '01, '06

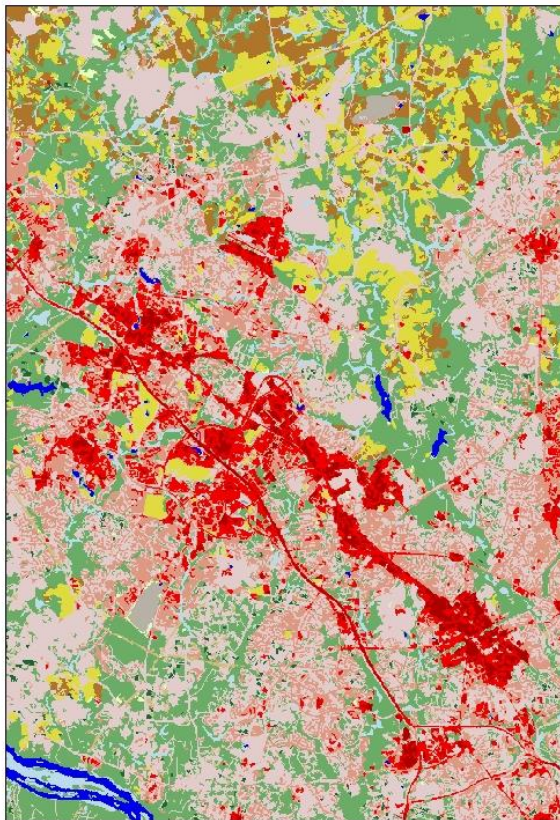


8 Classes

- 11 Water
- 21 Developed Open Space
- 25 Developed Other
- 30 Barren
- 40 Forest incl. Woody Wetland
- 50 Grassland/Shrub
- 80 Agriculture
- 95 Wetland

Process: Collapse Classes

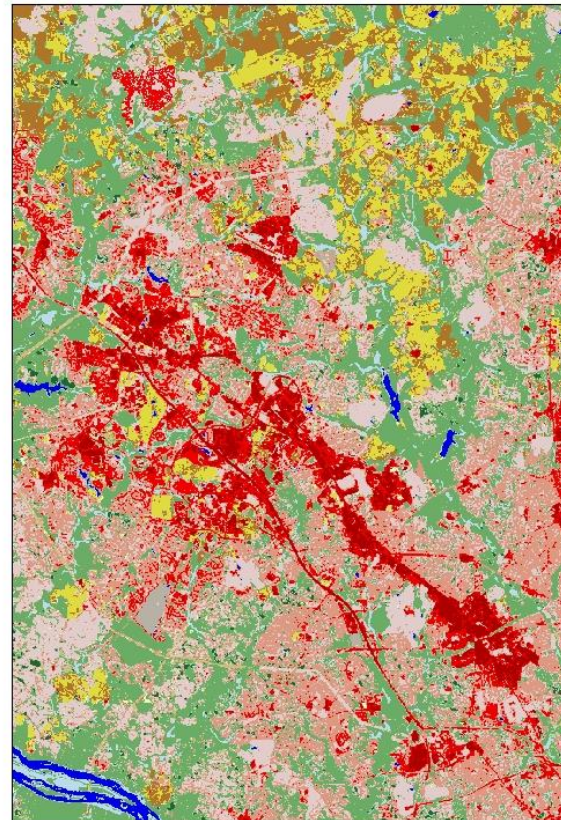
NLCD 2011 Edition '01, '06, '11



16 Classes

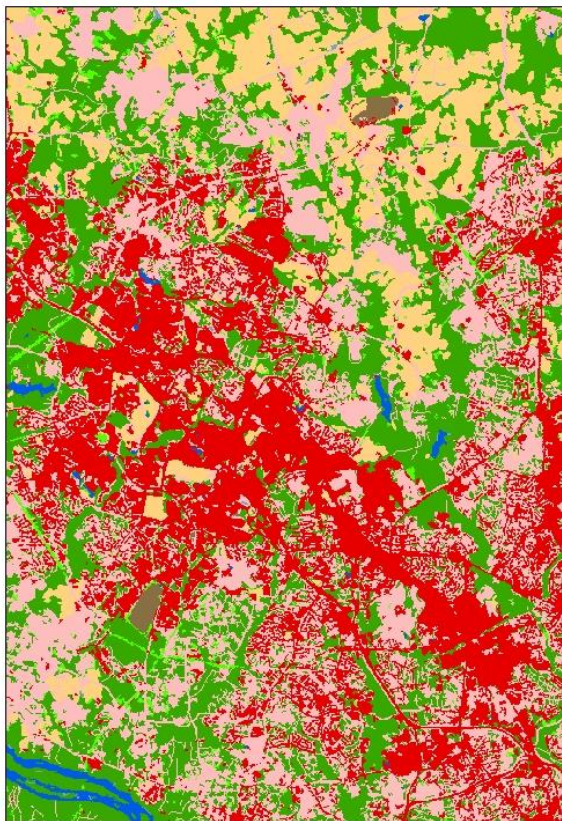
- Open water
- Developed open space
- Low intensity developed
- Med. intensity developed
- High intensity developed
- Barren
- Unconsolidated Shorelines
- Deciduous forest
- Evergreen forest
- Mixed forest
- Shrub/scrub
- Grassland/herbaceous
- Pasture/hay
- Cultivated crops
- Woody wetlands
- Emergent wetlands

CBLCD 2010 Release '84, '92, '01, '06



Process: Collapse Classes

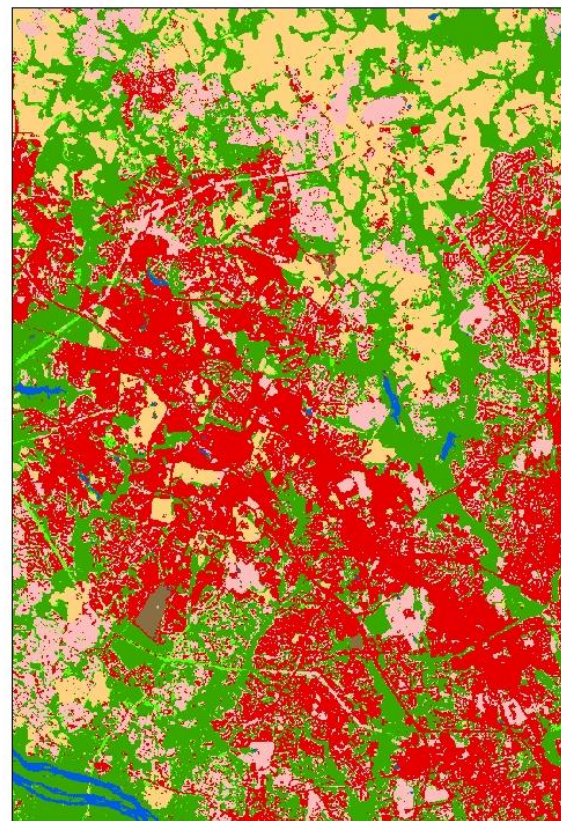
NLCD 2011 Edition '01, '06, '11



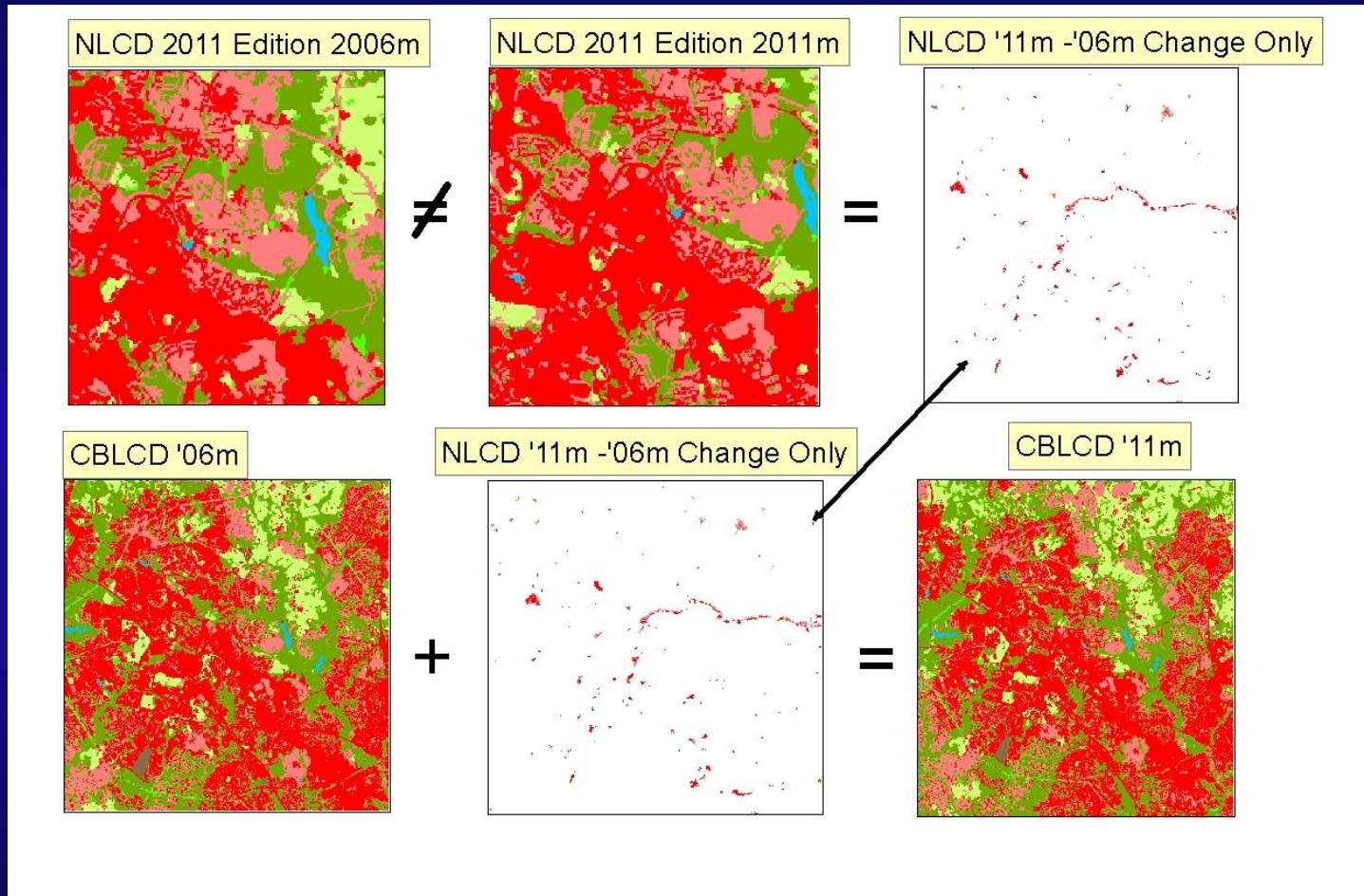
8 Classes

- 11 Water
- 21 Developed Open Space
- 25 Developed Other
- 30 Barren
- 40 Forest incl. Woody Wetland
- 50 Grassland/Shrub
- 80 Agriculture
- 95 Wetland

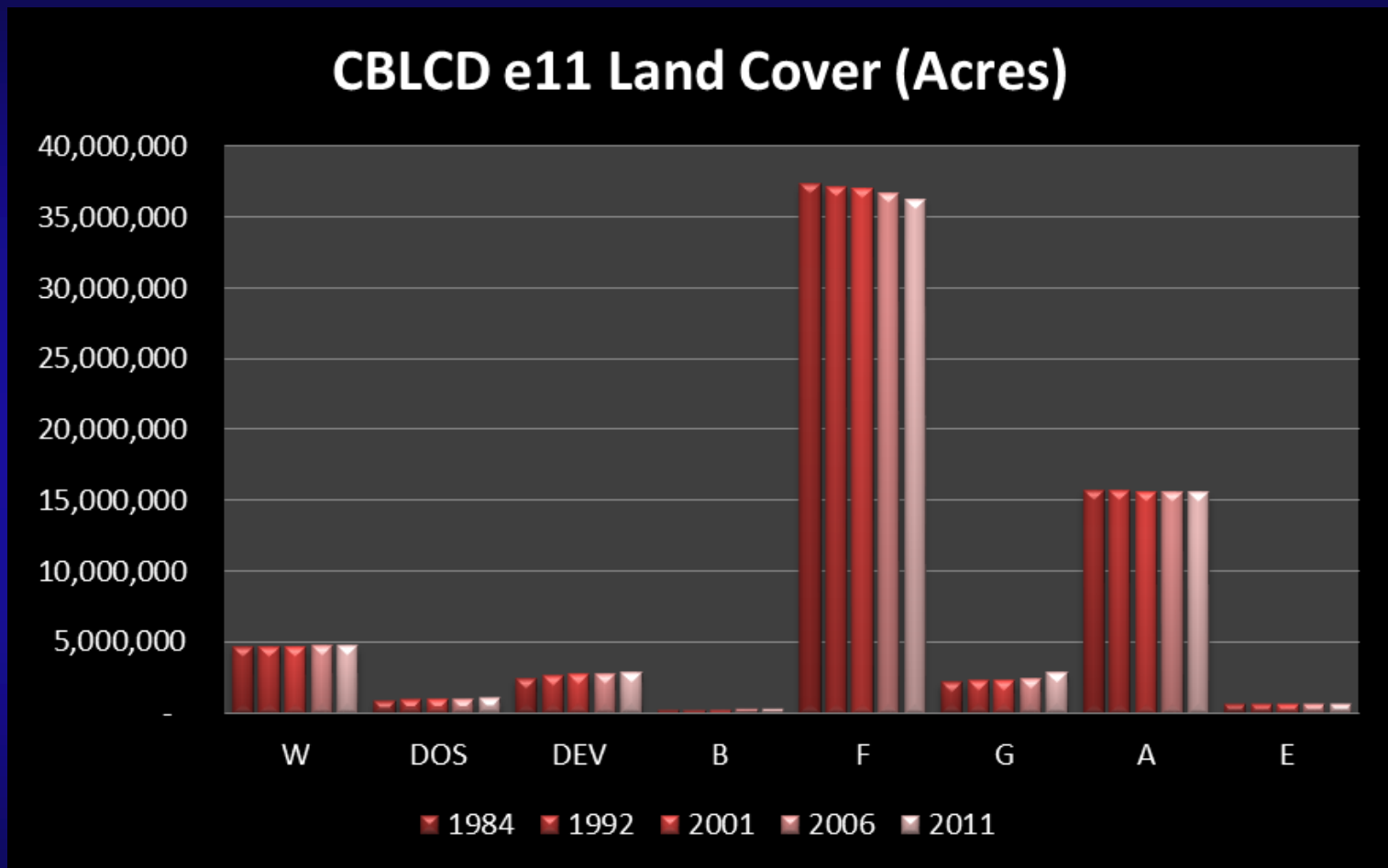
CBLCD 2010 Release '84, '92, '01, '06



Process: Create CBLCD e11 2011

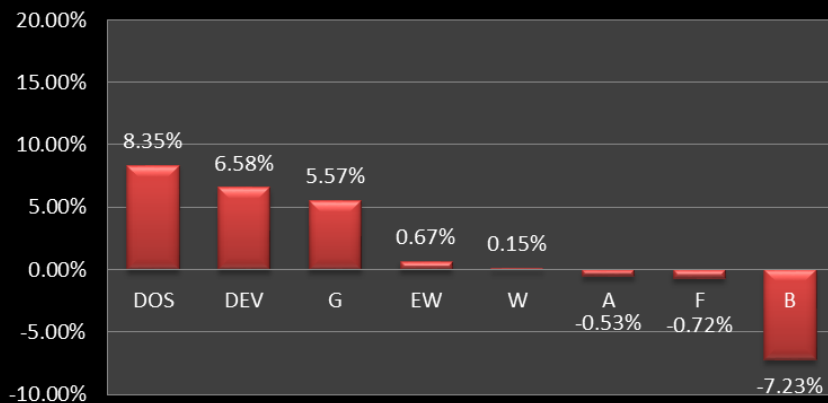


Results: CBLCD e11 Raw Acres

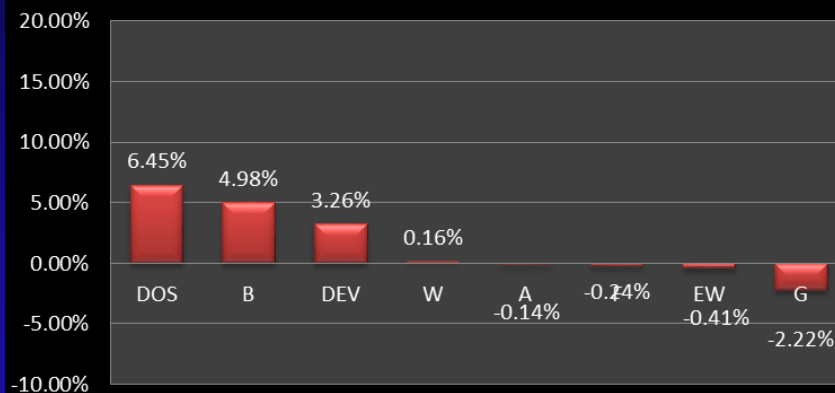


Results: Percent Change

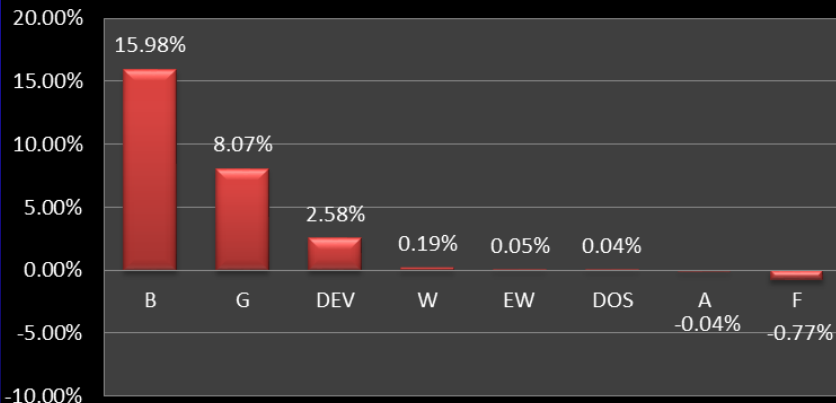
Percent Change '84-'92



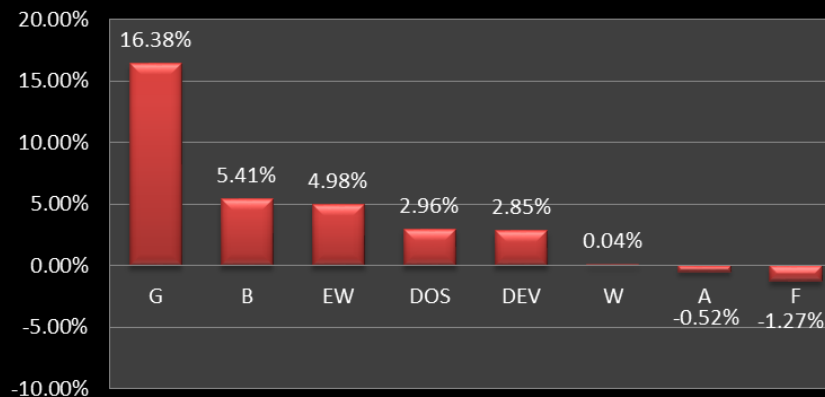
Percent Change '92-'01



Percent Change '01-'06

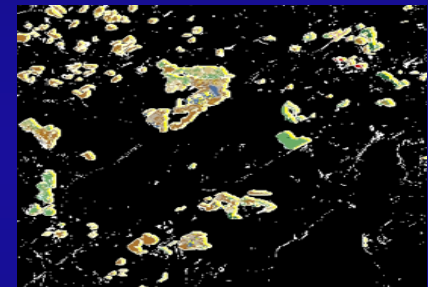


Percent Change '06-'11



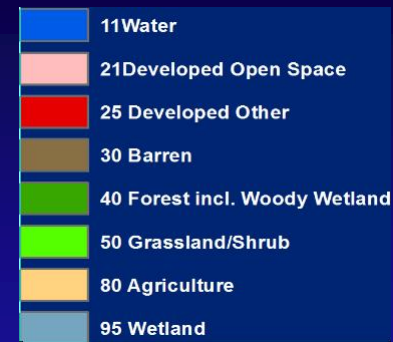
CBLCD First Release in 2010

- 16 Anderson Level II Classes
- Change Detected Using MDAF Spectral Imagery Analysis
- Based on Combined NLCD and CCAP Base Map

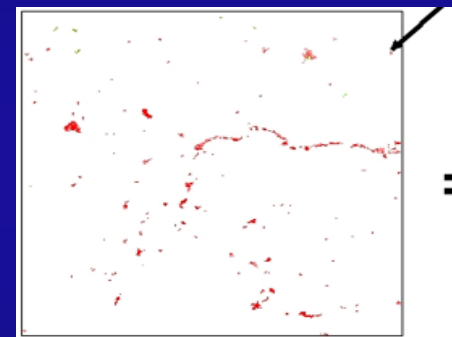


CBLCD 2011 Edition: 2015 Release

- Eight “Modified” (m) Anderson Level II Classes



- NLCD '06m – '11m Change Used to Create CBLCD '11



- Created by USGS at the CBPO



CBLCD Data First Release

(16 Classes)

[https://archive.chesapeakebay.net/gis/
CBLCD_Series/
ChesBay_LandCover_DataSeries.zip](https://archive.chesapeakebay.net/gis/CBLCD_Series/ChesBay_LandCover_DataSeries.zip)

CBLCD 2011 Edition Release

Release is in USGS Review

**Release Date and Location is To Be Announced
(Likely By June 2015)**

Questions?

Frederick M Irani, USGS
Chesapeake Bay Program Office
410 Severn Avenue,
Annapolis, MD 21146
410 267-9845
FIrani@USGS.GOV

Peter Claggett, USGS
Chesapeake Bay Program Office
410 Severn Avenue,
Annapolis, MD 21146
410 267-5771
PClaggett@USGS.GOV

