

UPDATE ON NEW TREE CANOPY AND FOREST DATA FROM THE CHESAPEAKE BAY PROGRAM

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CBP Land Use Products

Currently available

- 2013-14 – 2017-18 land change product using NAIP 1-meter imagery
- Visual and tabular (by county) data
- <http://cicapps.org/obj1lu/>

Coming in 2022

- Full wall-to-wall land use using NAIP and LIDAR 1-meter imagery, local tax parcel and zoning data set,
- Analysis methods applied to 2013-14 imagery as well
- Will offer more accurate estimate of 2013-14 – 2017-18 change



2021 Full Wall-to-Wall Land Use

CBP Full Land Use/Cover Classification (61 classes, final version)

1. Water (10)

1.1 Lentic

- 1.1.1 Estuary (tidal)
- 1.1.2 Lakes & Ponds

1.2 Lotic

- 1.2.1 Streams
 - 1.2.1.1 Open Channel
 - 1.2.1.2 Tree Canopy over Channel
 - 1.2.1.3 Culverted/ Buried Channel
- 1.2.2 Ditches
 - 1.2.2.1 Open Ditch
 - 1.2.2.2 Tree Canopy over Ditch
 - 1.2.2.3 Culverted/ Buried Ditch

2. Developed (12)

2.1 Impervious

- 2.1.1 Roads
- 2.1.2 Structures
- 2.1.3 Other Impervious (Parking lots, driveways)
- 2.1.4 Tree Canopy (TC) over Impervious
 - 2.1.4.1 TC over Roads
 - 2.1.4.2 TC over Structures
 - 2.1.4.3 TC over Other Impervious

2.2 Pervious

- 2.2.1 Turf Grass
- 2.2.2 Bare Developed
- 2.2.3 Suspended Succession (rights-of-way)
 - 2.2.3.1 Barren
 - 2.2.3.2 Herbaceous
 - 2.2.3.3 Scrub-shrub
- 2.2.4 Tree Canopy over Turf Grass

3. Forest (7)

- 3.1 Forest (≥ 1 acre, 240-ft width)
- 3.2 Tree Canopy in Agriculture
- 3.3 Harvested Forest (≤ 3 years)
 - 3.3.1 Barren
 - 3.3.2 Herbaceous
- 3.4 Natural Succession (> 3 years)
 - 3.4.1 Barren
 - 3.4.2 Herbaceous
 - 3.4.3 Scrub-shrub

4. Production (16)

4.1 Agriculture

- 4.1.1 Cropland
 - 4.1.1.1 Barren
 - 4.1.1.2 Herbaceous
- 4.1.2 Pasture
 - 4.1.2.1 Barren
 - 4.1.2.2 Herbaceous
- 4.1.3 Orchard/vineyard
 - 4.1.3.1 Barren
 - 4.1.3.2 Herbaceous
 - 4.1.3.3 Scrub-shrub
- 4.1.4 Animal Operations (TBD)
 - 4.1.4.1 Impervious
 - 4.1.4.2 Barren
 - 4.1.4.3 Herbaceous

4.2 Solar fields

- 4.2.1 Impervious
- 4.2.2 Pervious
 - 4.2.2.1 Barren
 - 4.2.2.2 Herbaceous
 - 4.2.2.3 Scrub-shrub

4.3 Extractive (active mines)

- 4.3.1 Barren
- 4.3.2 Impervious

5. Wetlands and Water Margins (16)

5.1 Tidal

- 5.1.1 Barren
- 5.1.2 Herbaceous
- 5.1.3 Scrub-shrub
- 5.1.4 Tree Canopy
- 5.1.5 Forest

5.2 Riverine (Non-tidal)

- 5.2.1 Barren
- 5.2.2 Herbaceous
- 5.2.3 Scrub-shrub
- 5.2.4 Tree Canopy
- 5.2.5 Forest

5.3 Terrene/Isolated (Non-tidal)

- 5.3.1 Barren
- 5.3.2 Herbaceous
- 5.3.3 Scrub-shrub
- 5.3.4 Tree Canopy
- 5.3.5 Forest

5.4 Bare shore



Interpreting Land Use Change Product

- Tree Canopy over Impervious Surfaces (TCI) = trees over roads and non-road impervious surfaces and trees within 3 meters of rail centerlines.
 - Gains: new tree canopy interpreted from imagery
 - Losses: tree canopy change to a non-tree canopy class interpreted from imagery
- Tree Canopy over Turf Grass (TCT) = tree canopy in small patches that do not qualify as forest and within 20 meters of structures or turf grass image segments within densely developed areas and within 10 meters of structures or turf grass image segments in rural agricultural and forested areas.
 - Gains: new tree canopy interpreted from imagery in small patches that are not adjacent to agriculture.
 - Losses: tree canopy classed as “Tree Canopy over Turf Grass” changes to a non-tree canopy class, interpreted from imagery
- Forest (FOR) = all contiguous patches of tree canopy that are greater or equal to one acre in size AND have sufficient width (72-meters) to contain a 1-acre circle, providing at least some area free of edge effects. Added to this class for 2017 are small or narrow patches of trees in rural agricultural areas (e.g., wind breaks and riparian buffers).
 - Gains: new tree canopy interpreted from imagery in patches of sufficient size, girth, or rural agricultural context to qualify as “Forest”.
 - Losses: tree canopy within “Forest” changes to a non-tree canopy class interpreted from imagery

See: https://www.chesapeakebay.net/channel_files/42976/lu_change_per_phase_6_classes_v2.pdf



One-meter Resolution Land Use Products for Chesapeake Bay Counties

Land Use: 60+ classes

2017/2018 Land Use and 2013/14 – 2017/18 Land Use Change

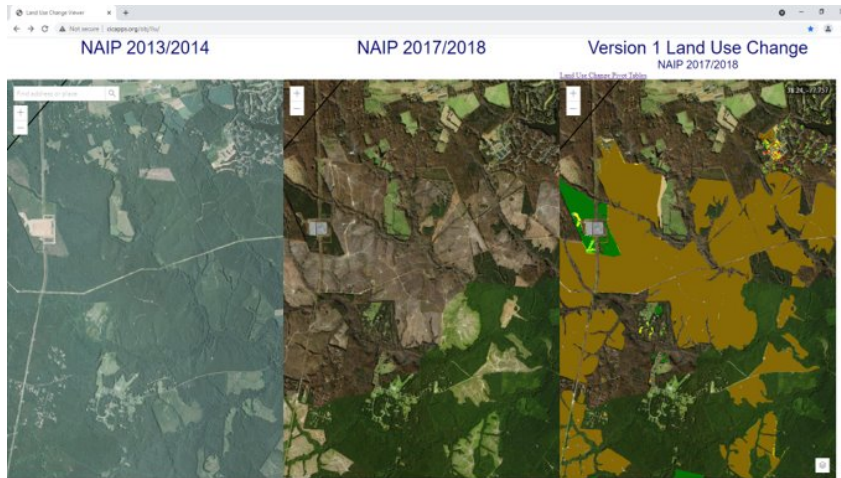
- Version 1 (internal for use in CAST) Complete!
- Version 2 (public) will be released in February 2022

2021/22 Land Use and 2013/14 – 2017/18 – 2021/22 Land Use Change

- Version 1 (internal for CAST-23) will be completed July 2023
- Version 2 (public) will be released in February 2024



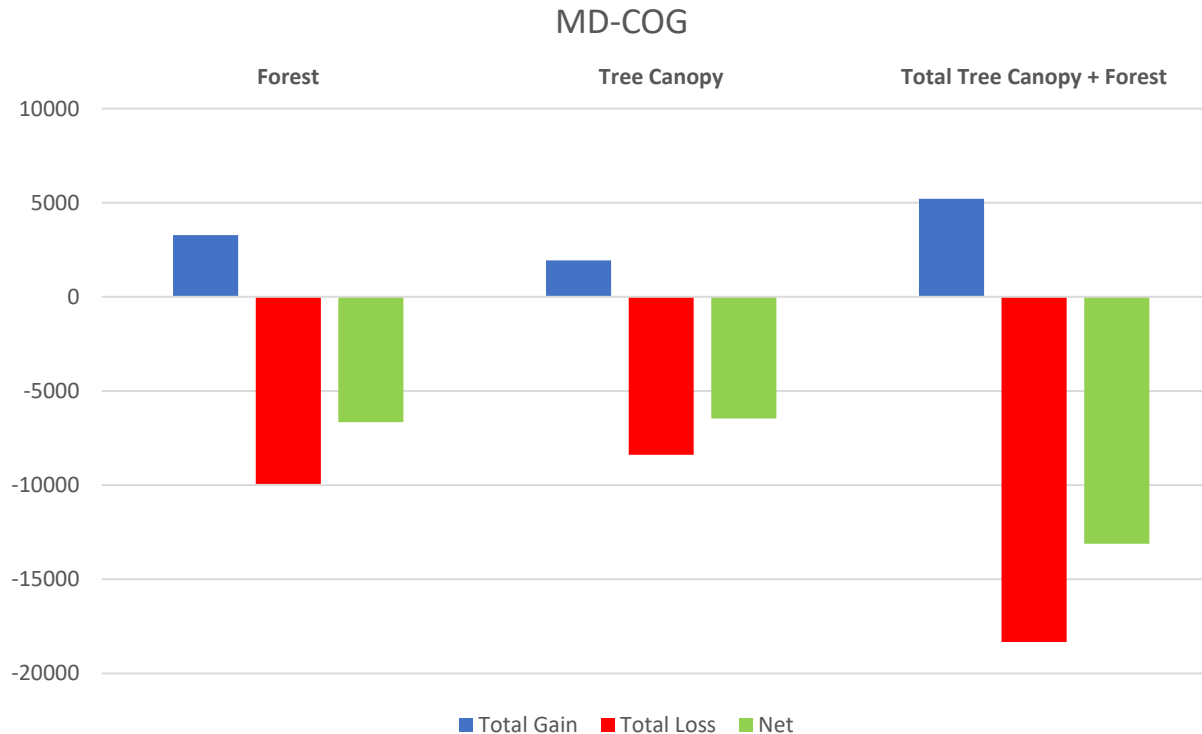
2013-14 – 2017-18 Land Use Change Data



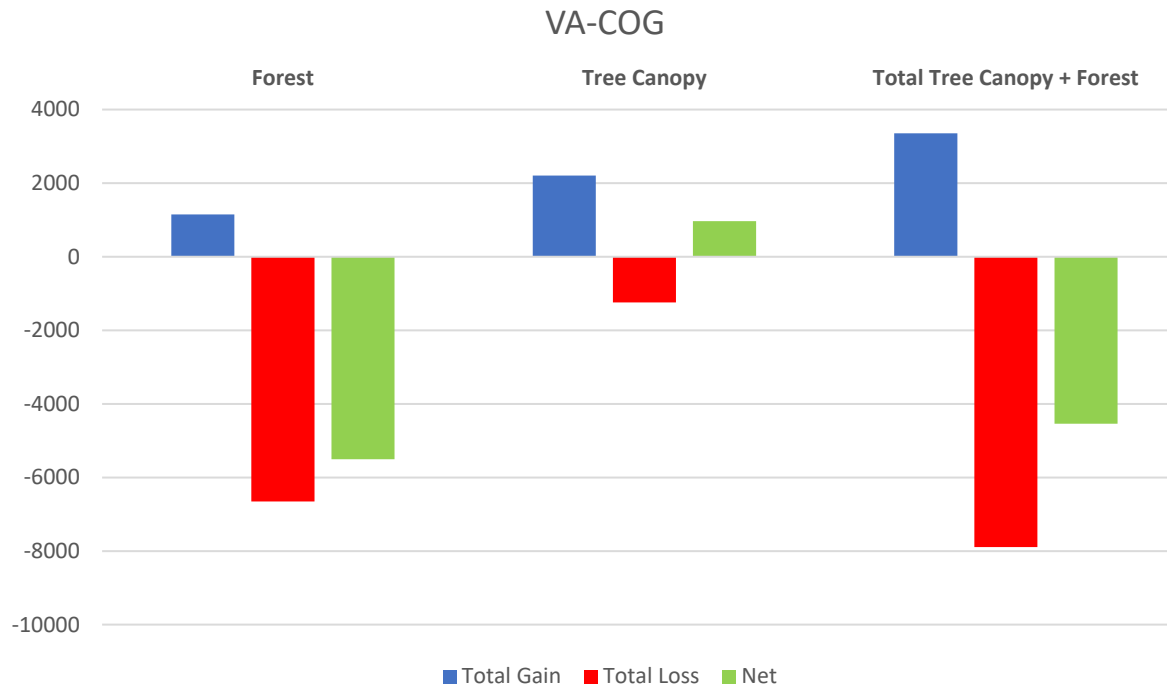
Visual and tabular data available at:
[Land Use Change Viewer \(cicapps.org\)](http://Land Use Change Viewer (cicapps.org))

T1-T2 LU	IR	INR	TCI	TG	TCT	FORE	WLF	WLO	WLT	MO	CRP	PAS	WAT	Loss
IR	-	-	12	-	0	0	-	-	-	-	-	-	-	12
INR	3	-	28	24	0	1	0	-	-	8	1	4	0	70
TCI	0	17	-	6	-	-	-	-	-	5	0	0	-	28
TG	10	42	-	-	86	2	-	-	-	54	-	0	-	194
TCT	0	57	-	40	-	1	-	-	-	64	1	1	-	164
FORE	24	160	1	625	310	-	-	-	-	10,985	16	78	1	12,202
WLF	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WLO	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WLT	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MO	34	270	0	440	14	1,126	-	-	-	-	0	7	19	1,910
CRP	3	3	-	3	-	1	-	-	-	19	-	18	0	47
PAS	5	29	-	22	2	130	-	-	-	27	7	-	10	232
WAT	-	-	-	-	0	1	0	-	-	1	-	3	-	5
Gain	80	577	41	1,160	412	1,262	0	-	-	11,165	24	111	31	14,863
TotGain	80	577	41	1,160	412	1,262	0	-	-	11,165	24	111	31	
TotLoss	12	70	28	194	164	12,202	-	-	-	1,910	47	232	5	
Net	68	508	13	967	248	(10,940)	0	-	-	9,255	(23)	(121)	26	

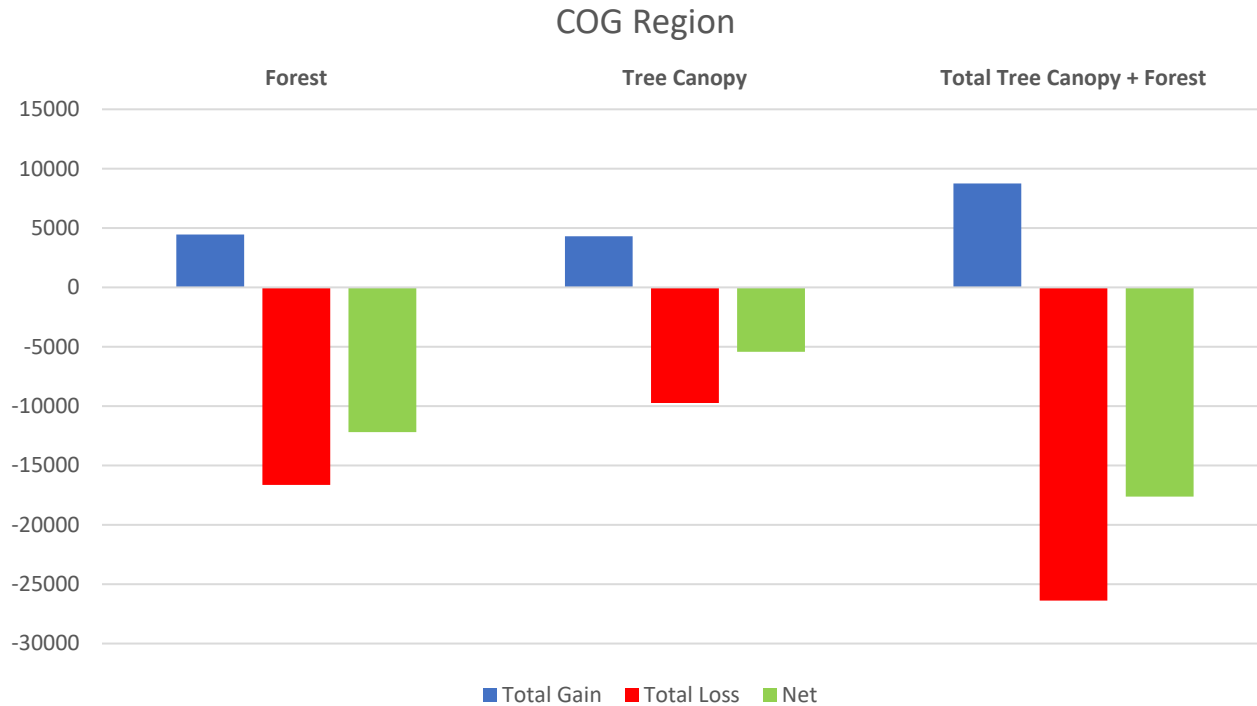
2013-14 – 2017-18 Land Use Change: Some Preliminary Results



Some Preliminary Results



Some Preliminary Results



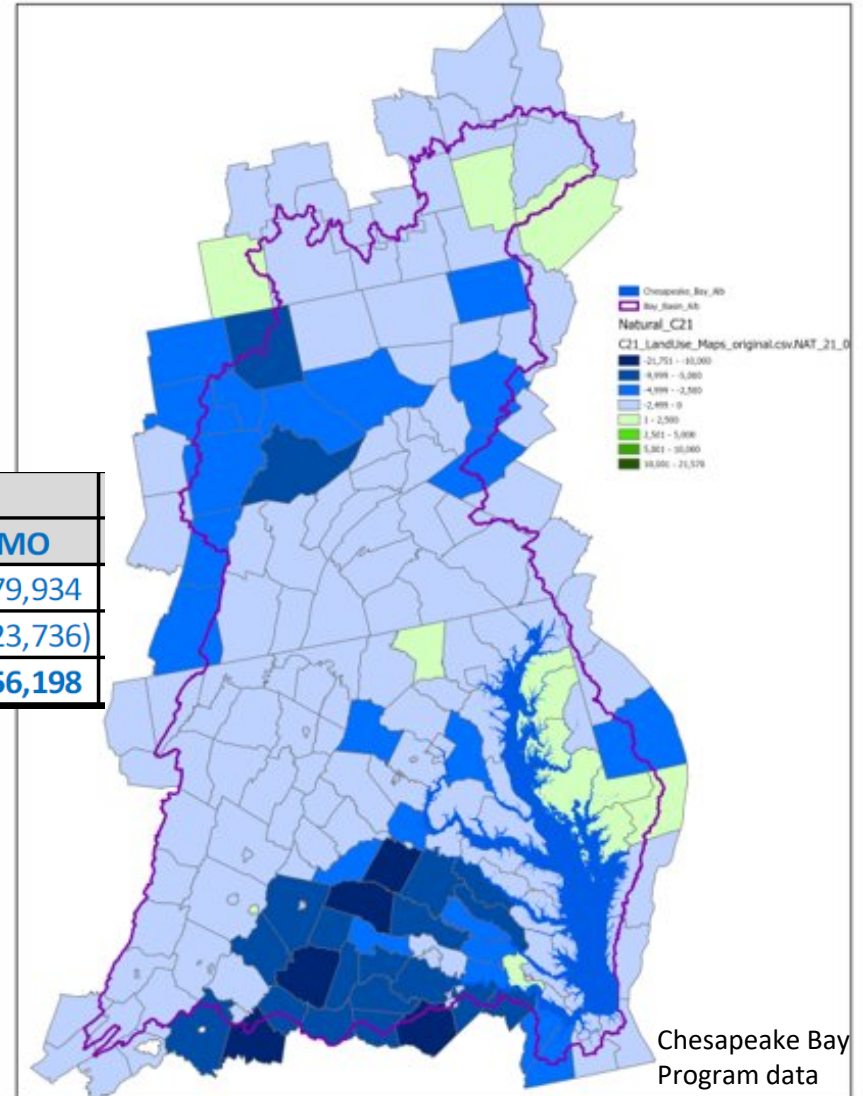
Forest Change by County

- Natural change is basically change in forest acreage 2013-14 – 2017-18

Bay-wide Change

Change: 2013 - 2017	CAST-21			
Land Use	DEV	NAT	AG	MO
Gains	121,510	4,772	3,960	279,934
Losses	-	(359,949)	(26,491)	(23,736)
Net Change	121,510	(355,177)	(22,531)	256,198

DEV = Developed (impervious surfaces and turf grass); NAT = Natural (forest, wetlands, and water), AG = Agriculture (cropland and pasture), MO = Mixed Open (natural and suspended succession, bare developed)



Chesapeake Bay Program data



More Information

Land Use Change Methods

https://www.chesapeakebay.net/channel_files/42095/lu_change_methods_20210505.pdf

Land Use Classification Scheme

https://www.chesapeakebay.net/channel_files/42095/lu_classification_proposedfinal_20210505_revised.pdf



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