



Tree Canopy Indicator Update

Forestry Workgroup 12/7/22
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Topics for Today

- Quick review Tree Canopy outcome elements
- Evolution of proposed methodology
 - Original approved method 2018
 - Revised proposal May 2022 and WQGIT concerns
 - Final proposal – option 1 + 2
- Questions/Discussion, Decision, Next Steps

Through the Chesapeake Bay Watershed Agreement, the Chesapeake Bay Program has committed to...



Vital Habitats Goal

Tree Canopy Outcome: Continually increase urban tree canopy capacity to provide air quality, water quality and habitat benefits throughout the watershed. **Expand urban tree canopy by 2,400 acres by 2025.**

Defining & Measuring Tree Canopy

“In this Management Strategy, we use a broad definition of “urban” tree canopy that includes all sizes of communities. It is important to note that this goal is intended to reflect a *net gain* in acreage of tree canopy, after accounting for canopy losses due to various factors such as development, storms, pests/diseases, and natural mortality. Meeting the goal requires protecting as much of our existing tree canopy as possible and planting enough to both mitigate losses and expand the tree canopy cover by 2,400 acres.”

Defining & Measuring Tree Canopy

- New quantitative outcome in CB Watershed Agreement – no baseline/indicator or tracking systems in place
- Management Strategy proposed to track progress using combination of 1) annual tree planting BMP data, and 2) high resolution land cover dataset, under development at the time
- Developed an approved methodology in 2018, but we have been waiting on updated land use data to test and refine it

Tree Canopy Indicator- Measuring Progress

1) Reported Tree Plantings

- Track and total 3 Urban Tree BMPs reported to NEIEN
 - Urban Tree Planting
 - Urban Forest Planting
 - Urban Forest Buffer
- Report on annual progress, ~~2010~~–2014– present (*2014 Agreement is starting point for adding 2400 new acres by 2025*)
- Use custom “no expiration” scenarios in NEIEN to make sure all new annual acres are counted

Tree Canopy Indicator Measuring Progress 2) Land Use Change Data

- CBP High Resolution Land Use data provides best tracking of Tree Canopy gains and losses over time
 - 2013/2014 – baseline status for Watershed Agreement
 - 2017/2018 – use to assess gains and losses (net change) since baseline
 - Future datasets every 4 or so years will be critical for tracking long term trend and progress

Tree Canopy Indicator Measuring Progress 2) Land Use Data

#1 Original 2018 proposal, track changes in

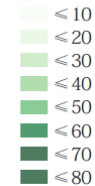
- Tree Canopy over Turf
- Tree Canopy over Impervious
- “Urban” Forest – only Forest that falls within Census Urban Areas & Clusters

And not include:

- Trees on agricultural land
- Forest outside of Census Urban Areas & Clusters

Tree Canopy in 2010 Census
Urban Areas/Clusters

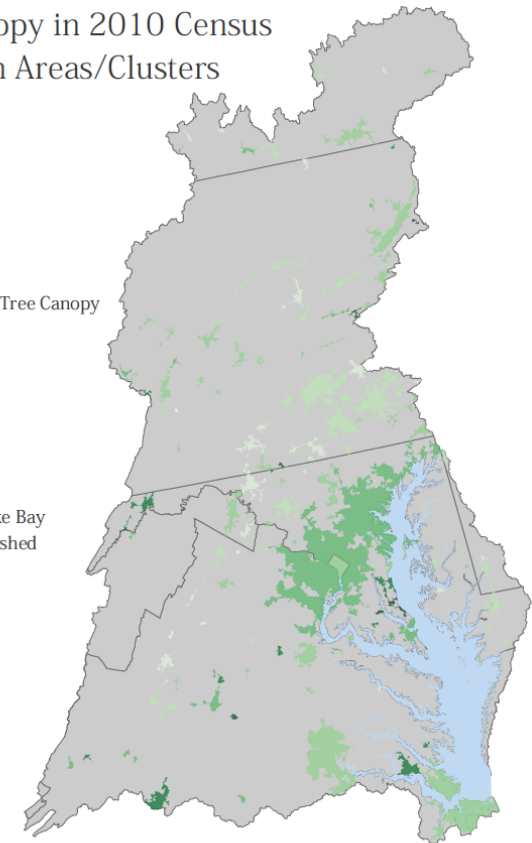
% Community Tree Canopy



Chesapeake Bay
Bay Watershed



0 15 30 60 90 120 Miles



Tree Canopy Indicator Measuring Progress 2) Land Use Data

#2 Proposal – May 2022

- Use Land Use Change Matrices to track all gains and losses of tree cover (forest+ tree canopy classes) on developed and developing lands

2013/14-2017/18	ROAD	IMPS	IMPO	TCIS	TURF	TCTG	PDEV	FORE	TCOT	HARF	NATS	CROP	PAST	EXTR	TDLW	RIVW	TERW
ROAD	0	14	338	696	74	66	206	138	75	1	17	11	14	4	0	2	0
IMPS	1	0	937	508	277	88	143	7	2	1	37	75	84	2	0	0	0
IMPO	516	3,173	0	1,587	4,334	305	1,288	166	60	102	785	652	1,331	1	21	25	5
TCIS	42	485	690	0	2,446	0	1,599	0	0	181	408	98	184	6	3	7	1
TURF	0	828	5,558	0	0	8,514	1,089	107	106	21	127	3	8	725	0	0	0
TCTG	13	930	4,143	11	11,096	0	783	0	0	93	422	246	539	9	0	0	0
PDEV	1,130	4,377	6,865	0	15,251	49	0	304	33	221	417	142	79	1,270	0	0	0
FORE	1,161	2,764	8,918	732	13,096	28,221	28,107	0	22,046	175,564	81,474	19,557	23,186	4,066	1,381	5,568	193
TCOT	123	952	2,339	0	2,068	2,032	2,341	0	0	788	2,278	3,075	4,566	386	108	250	27
HARF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NATS	63	149	477	0	3,481	371	826	76,425	4,389	4,295	0	546	356	501	0	0	0
CROP	500	3,018	8,369	0	4,031	165	2,514	11,299	3,088	1,367	2,069	0	126	1,182	0	0	0
PAST	307	2,253	9,607	0	6,562	185	3,857	13,163	8,984	1,631	4,035	123	0	1,232	0	0	0

Focus on changes in tree cover on developed/developing lands:

Gain = change from impervious/turf/pervious developed to **tree canopy/forest**

Loss = change from **tree canopy/forest** to impervious/turf/pervious developed

Tree Canopy Indicator Measuring Progress 2) Land Use Data

#2 Proposal – May 2022

- Use Land Use Change Matrices to track all gains and losses of tree cover (forest+ tree canopy classes) on developed and developing lands

Water Quality GIT Concerns & Discussion

- Tracking all loss of forest to development extends beyond the scope of the outcome; focus on urban/community areas
 - *Loss of forest to development is important to communicate but better captured in the Land Use Methods & Metrics Outcome*
- Need an urban/community “footprint” for 2014 baseline to track change over time
 - *With #2 Proposal, there is no baseline, the footprint is always expanding and losses from development typically outweigh changes within existing urban/community areas*
 - *Align urban/community footprint with local units of government where applicable*

Tree Canopy Indicator Measuring Progress 2) Land Use Data

Option 1 – Census Places-2020

- Includes local units of government + un-incorporated communities
- Used as community metric in fed/state Urban & Community Forestry program
- Narrowest footprint we would want to use (doesn't necessarily include all subdivisions/developed areas in more rural areas)

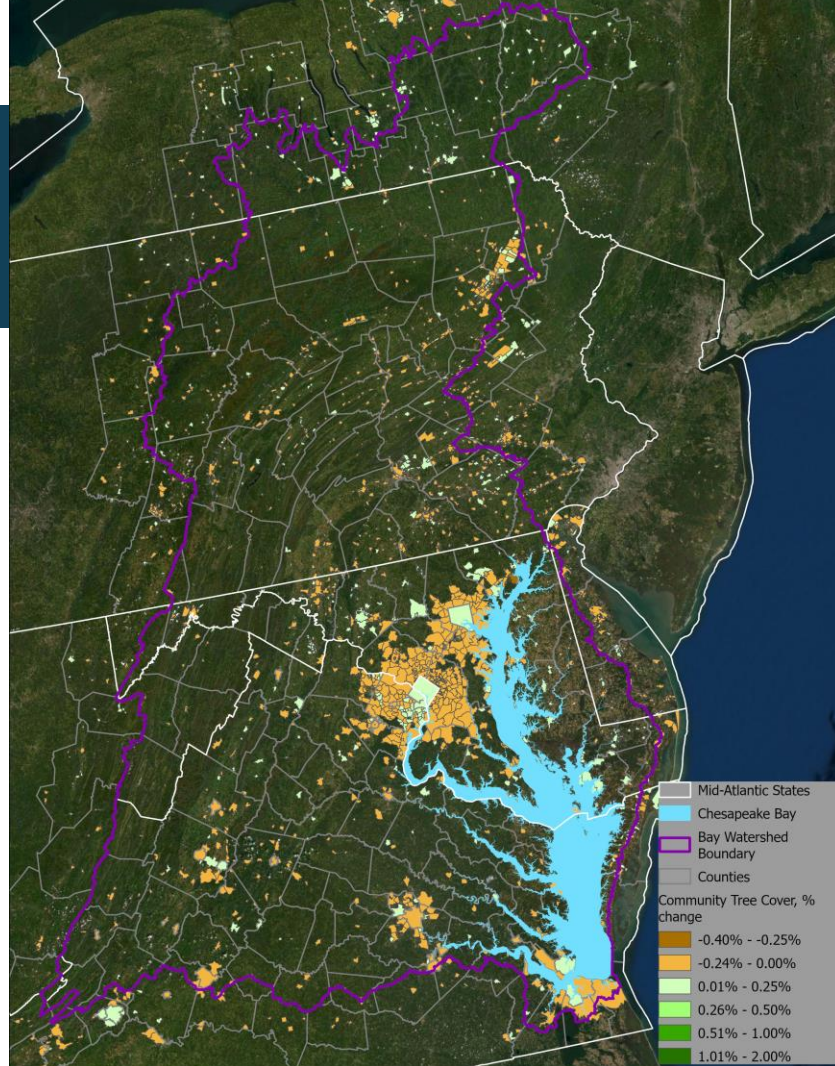
#3 Final Proposal – Options 1 + 2

- Track tree cover gains and losses based on census-defined areas

Option 2 – Census Places 2020 + Census Urbanized Areas (2020 coming soon)

- Includes more developed/developing areas that fall outside census places – especially in headwaters/rural areas
- Also includes a fair amount of ag and forest land that may not be as relevant for our urban/community tree canopy tracking

Option 1 – Census places





Yellow=census place boundaries
Gray hatched= census urbanized area

Tree Canopy Indicator Measuring Progress

2) Land Use Data

#3 Final Proposal – Options 1 + 2

- Track tree cover gains and losses based on census-defined areas

Acres of tree cover and net change shown for each Option,

Option 1

Option 2

	Census Places (2020)			Census Places (2020) + Urban Areas (2010)		
	2013-14	2017-18	Net Change	2013-14	2017-18	Net Change
Delaware	4,039	4,083	44	10,082	10,143	61
District of Columbia	13,637	13,658	21	13,637	13,658	21
Maryland	663,316	648,762	(14,553)	794,333	778,917	(15,416)
New York	59,855	59,969	114	78,083	78,217	134
Pennsylvania	287,903	285,609	(2,294)	449,944	446,097	(3,846)
Virginia	653,856	645,443	(8,413)	829,401	818,046	(11,355)
West Virginia	16,470	16,429	(41)	33,236	33,066	(170)
Watershed	1,699,076	1,673,954	(25,122)	2,208,714	2,178,143	(30,571)

Questions/Discussion

- Thoughts on using Option 1 versus Option 2?

Official FWG members – please add your preference in the chat: Option 1, Option 2, Either fine

- Any “fatal flaw” concerns with either approach?

Next Step – seek WQGIT approval on 1/23