Investigating Excess in 2020 Progress

2022

Contents

- What does BMP excess (cutoff) mean in CAST?
- Example of excess/cutoff
- Why excess occurs
- How should BMPs be reported and how BMPs are currently reported

- Reference:
  - Maps of 2020 excess (Slides 15-27)
  - For each jurisdiction, what BMPs are in excess and how are states reporting them (Slides 31-39)

Excess: Definition

Excess/Cutoff: Total units of a BMP in a specific geography that do not receive credit because there were **not enough units** in that area for them to receive credit.

Excess: Example

Example (BMP and geographic units will vary):
Land River Segment X:

Reports **100 acres of cover crop** (applied to crop land)

Only has **70 acres of crop land**

- 30 acres of cover crop has no where to go
- 30 acres of cover crop = BMP excess

Receives load **reduction credit on 70 acres** of crop land

- That 100% implementation!

Receives **NO load reduction for 30 acres** of BMP excess

- often referred to as “cutoff”

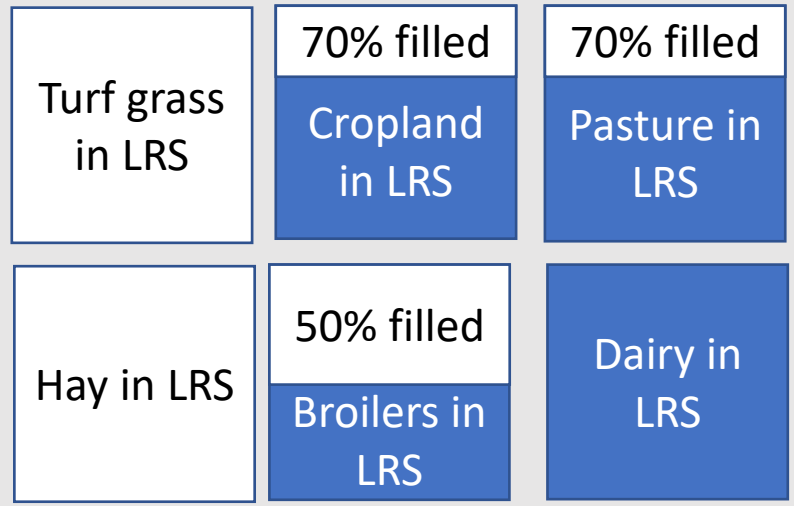
Scale Jurisdictions Reported BMPs in 2020

BMPs are applied to land use/animal unit.

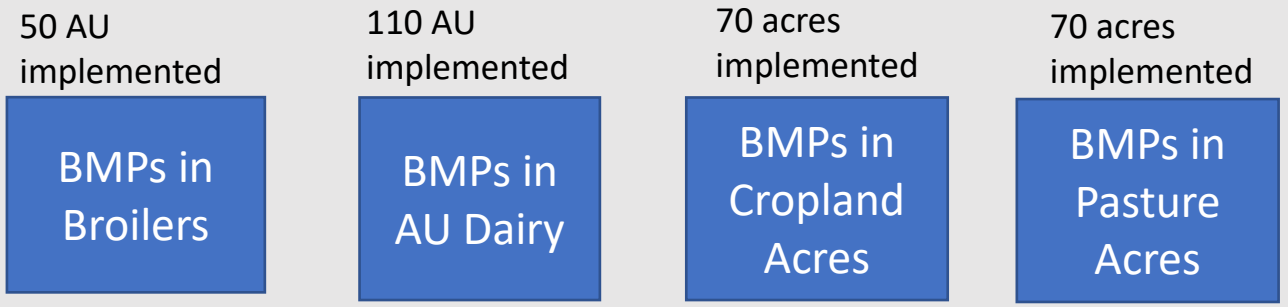
Every land river segment has a set number of acres and animal available for BMPs to be applied to.

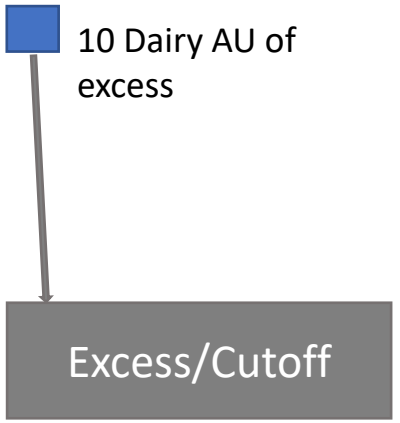
Example LRS Land Use/Animal Units

- 10 acres hay
- 10 acres cropland
- 10 acres of pasture
- 10 acres turfgrass
- 100 AU of Broilers
- 100 AU Dairy



2020 Implementation in Example LRS





Excess: Why does it happen?

Excess may happen when:

- The acreage of a specific BMP reported within a given land river segment geography exceeds the amount of acreage available for that BMP to be placed on
  - 100% implementation has been reported for the geography.
- BMPs reported at the full county scale that is both inside and outside of the watershed. (BMPs outside of the watershed should be excluded if possible.)
- The land use of the model does not match a jurisdiction's records
- BMPs are reported with inaccurate implementation dates
- Multiple BMPs may be assigned to the same geography/land use
- Land use change BMPs can reduce the amount of land use available for implementation

Excess: Multiplicative and Mutually Exclusive BMPs

Excess may happen when:

- Multiple BMPs may be assigned to the same geography/land use

BMPs can generally be additive or multiplicative:

1. **Mutually exclusive:** BMPs within the same BMP group cannot be placed on the same acreage as each other.
   - Example: A forest buffer or grass buffer can be assigned to a set acreage, but not both.
2. **Multiplicative:** BMPs can be layered on the same acreage as each other.
   - Example: Nutrient management plan and cover crop on same acreage

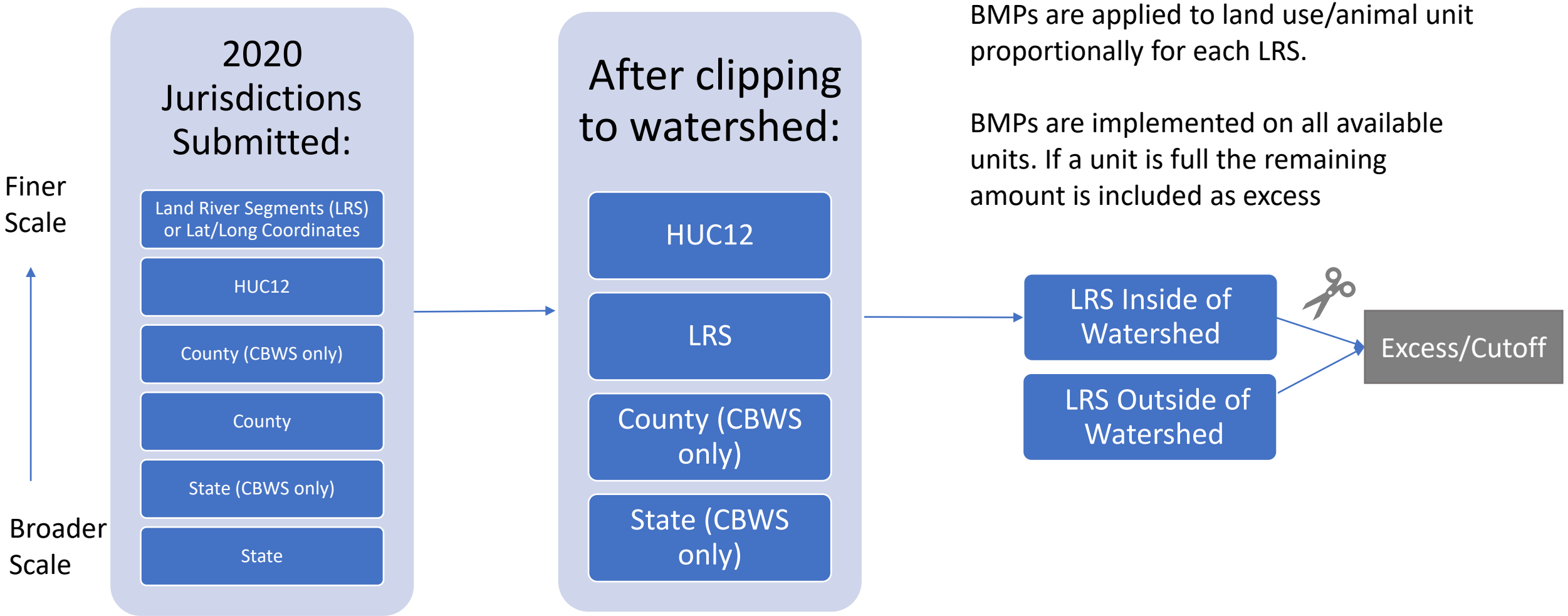
Excess: How should BMPs be reported?

- Per Attachment 6 of the CBP Grant Guidance: “Jurisdictions are to report BMPs as they occur on the landscape at the **most site-specific scale** that conforms with legal and programmatic constraints, and at a scale compatible to data input for the Chesapeake Bay Program partnership modeling tools.”

How do BMPs get processed by CAST?

1. New implementation BMP acres are broken down by load source and land river segment
2. Placed on the available land use acreage for that land river segment.

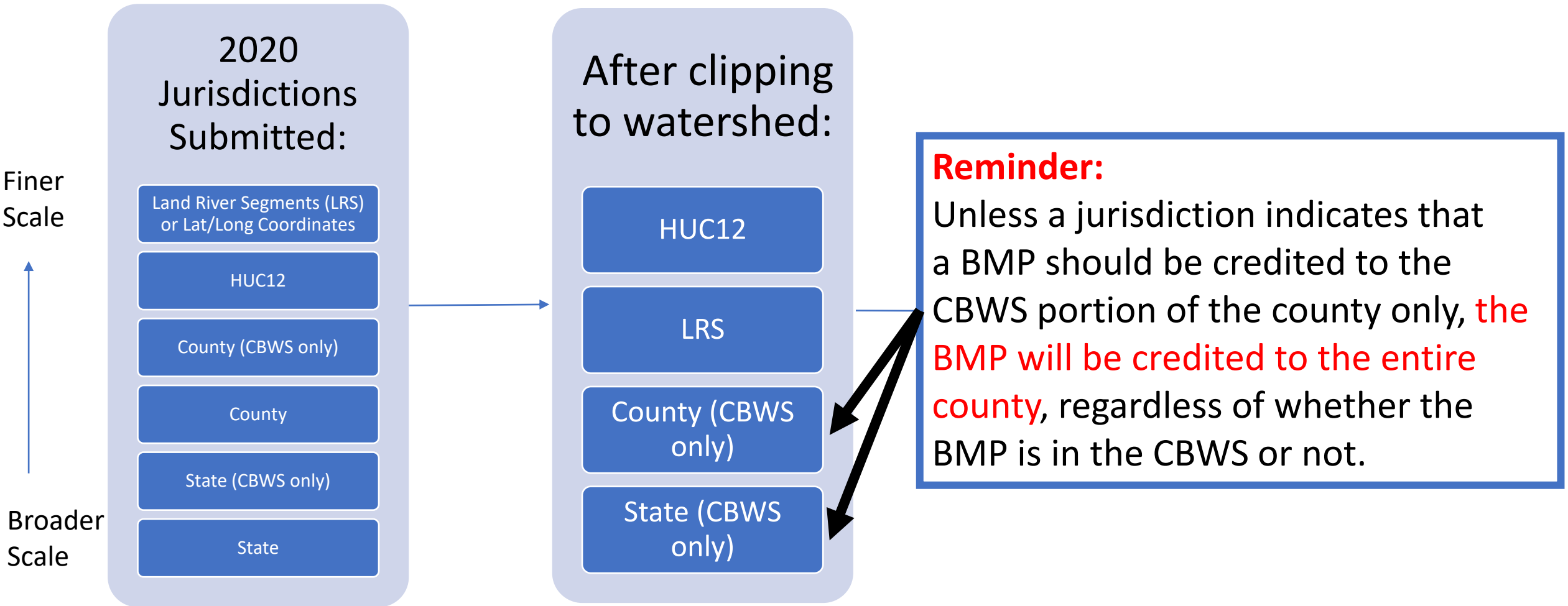
Scale Jurisdictions Reported BMPs in 2020



BMPs are applied to land use/animal unit proportionally for each LRS.

BMPs are implemented on all available units. If a unit is full the remaining amount is included as excess

Scale Jurisdictions Reported BMPs in 2020



2020 Agricultural Land Use BMPs Excess - Watershed

Agriculture	Unit	Excess at State (CBWS Only) scale	Excess at State Scale
Barnyard Runoff Control	Acres	**3,259**	**5,142**
Cover Crops	Acres	81,444	81,444
Loafing Lot Management	Acres	58	59
Nutrient Management Core N	Acres	111,223	111,223
Nutrient Management Core P	Acres	106,821	106,821
Nutrient Management N Placement	Acres	2,593	2,593
Nutrient Management N Rate	Acres	2,594	2,594
Nutrient Management N Timing	Acres	2,753	2,753
Nutrient Management P Placement	Acres	2,593	2,593
Nutrient Management P Rate	Acres	2,593	2,593
Nutrient Management P Timing	Acres	2,593	2,593
Off Stream Watering Without Fencing	Acres	57	57
Precision Intensive Rotational/Prescribed Grazing	Acres	286	286
Soil Conservation and Water Quality Plans	Acres	73,342	73,342
Tillage Management	Acres	**184,646**	**400,928**
Wetland Creation - Floodplain	Acres	88	88
Total Agricultural Acres	**Acres**	**576,943**	**795,109**

Bold – BMP excess is being cutoff at state scale reported outside of the watershed

2020 Agricultural Upland Acres BMPs Excess - Watershed

Agriculture	Unit	Excess at State (CBWS Only) scale	Excess at State Scale
Forest Buffer Nitrogen Upland Acres	Upland Acres	165	165
Forest Buffer Phosphorus and Sediment Upland Acres	Upland Acres	48	48
Grass Buffer Nitrogen Upland Acres	Upland Acres	238	238
Grass Buffer-Streamside with Exclusion Fencing Nitrogen Upland Acres	Upland Acres	299	299
Grass Buffer-Streamside with Exclusion Fencing Phosphorus and Sediment Upland Acres	Upland Acres	74	74
Wetland Creation Upland Acres	Upland Acres	242	242
Total Agricultural Upland Acres	**Upland Acres**	**1,066**	**1,066**

2020 Agricultural Animal Units BMPs Cutoff - Watershed

Agriculture	Unit	Cutoff at State (CBWS Only) scale	Cutoff at State Scale
Animal Waste Management System	**Animal Units**	**1,719,085**	**1,797,563**
Mortality Composters	**Animal Units**	**1,753,023**	**2,249,915**
Riparian Fence	Animal Units	47,039	47,039
Total Agricultural Animal Units	**Animal Units**	**3,519,147**	**4,094,517**

Bold – BMP excess is being cutoff at state scale reported outside of the watershed

2020 Developed Acres BMPs Excess - Watershed

Developed	Unit	Excess at State (CBWS Only) scale	Excess at State Scale
Erosion and Sediment Control	Acres	326	326
Forest Planting	Acres	10	10
Impervious Surface Reduction	Acres	4	4
Mechanical Broom Technology - 1 pass/4 weeks	Acres	529	529
Nutrient Management Plan Low Risk Lawn	Acres	33	33
Tree Planting - Canopy	Acres	31	31
Stormwater Acres Treated Practices	Acres Treated	43,650	43,650
Dirt & Gravel Road Erosion & Sediment Control - Driving Surface Aggregate with Outlets (3 LRS)	Feet	17,592	17,592

2020 Septic BMPs Excess - Watershed

Septic	Unit	Excess at State (CBWS Only) scale	Excess at State Scale
Septic Connection	Number of Systems	26	26
Septic Denitrification - Conventional	Number of Systems	131	131
Septic Denitrification - Enhanced	Number of Systems	50	50
Septic Effluent - Enhanced	Number of Systems	1	1
Septic Pumping	Number of Systems	5,500	5,500
Septic Secondary Treatment - Conventional	Number of Systems	92	92
Septic Secondary Treatment - Enhanced	Number of Systems	7	7

2020 Natural BMPs Excess - Watershed

Natural	Unit	Excess at State (CBWS Only) scale	Excess at State Scale
Forest Harvesting Practices	**Acres**	**17,144**	**23,280**
Urban Shoreline Erosion Control Non-Vegetated (1 LRS)	Feet	235	235
Urban Shoreline Management (1 LRS)	Feet	32	32

Bold – BMP excess is being cutoff at state scale reported outside of the watershed

Investigative Mapping using CAST Report

Report Type: BMP Submitted vs. Credited Report
Geographic Scale: Land River Segments indicating if in or out of CBWS
Geographic Area: All LRS
Progress Scenario: 2020 Progress

1. **Only used BMPs that had an "excess" of > 0.00**
   - Excess is "Total units of a BMP in a specific geography that were not backed out but do not receive credit because there were not enough units in that area for them to receive credit"

2. **Created a pivot table to summarize the LRS by BMP type**
   - Different Load sources and animal units were aggregated (e.g., Conservation tillage "from full season soybeans to full season soybeans" and "Double Cropped Land to Double Cropped Land" were aggregated.
   - BMPs that have similar units and functions were combined. (e.g., Tillage management conservation, continuous high residue, and low residue were combined in the maps to "Tillage BMPs")

3. **Mapped units of excess by joining tables of excess amounts to land river segments by BMP.**

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Create Reports

View Documentation

* Required field

Report Type *

BMP Submitted vs. Credited Report

Report Name *

Land River Segments 2020 Submitted vs. Credited

Geographic Scale *

Land River Segment indicating if in or out of CBWS

Geographic Area *

Search...

MD-H24021PM1_3510_4000(CBWS)
MD-H24021PM3_3040_3340(CBWS)
MD-H24021PM4_3340_3341(CBWS)
MD-H24023PU2_4720_4750(CBWS)
MD-H24023PU3_4451_4450(CBWS)
PA-H42013SJ2_2530_2820(CBWS)
PA-H42013SJ3_2040_1980(CBWS)
PA-H42013SJ3_2250_2230(CBWS)
PA-H42013SW3_1870_1800(CBWS)
PA-H42027SL3_1710_1740(CBWS)
PA-H42027SW1_1560_1460(CBWS)
PA-H42027SW1_1570_1640(CBWS)
PA-H42027SW3_1580_1440(CBWS)
PA-H42043SL3_1960_2080(CBWS)
PA-H42043SL8_2080_2050(CBWS)

Public Shared With Me My Scenarios

Scenario *

2020 Progress

Submit Report

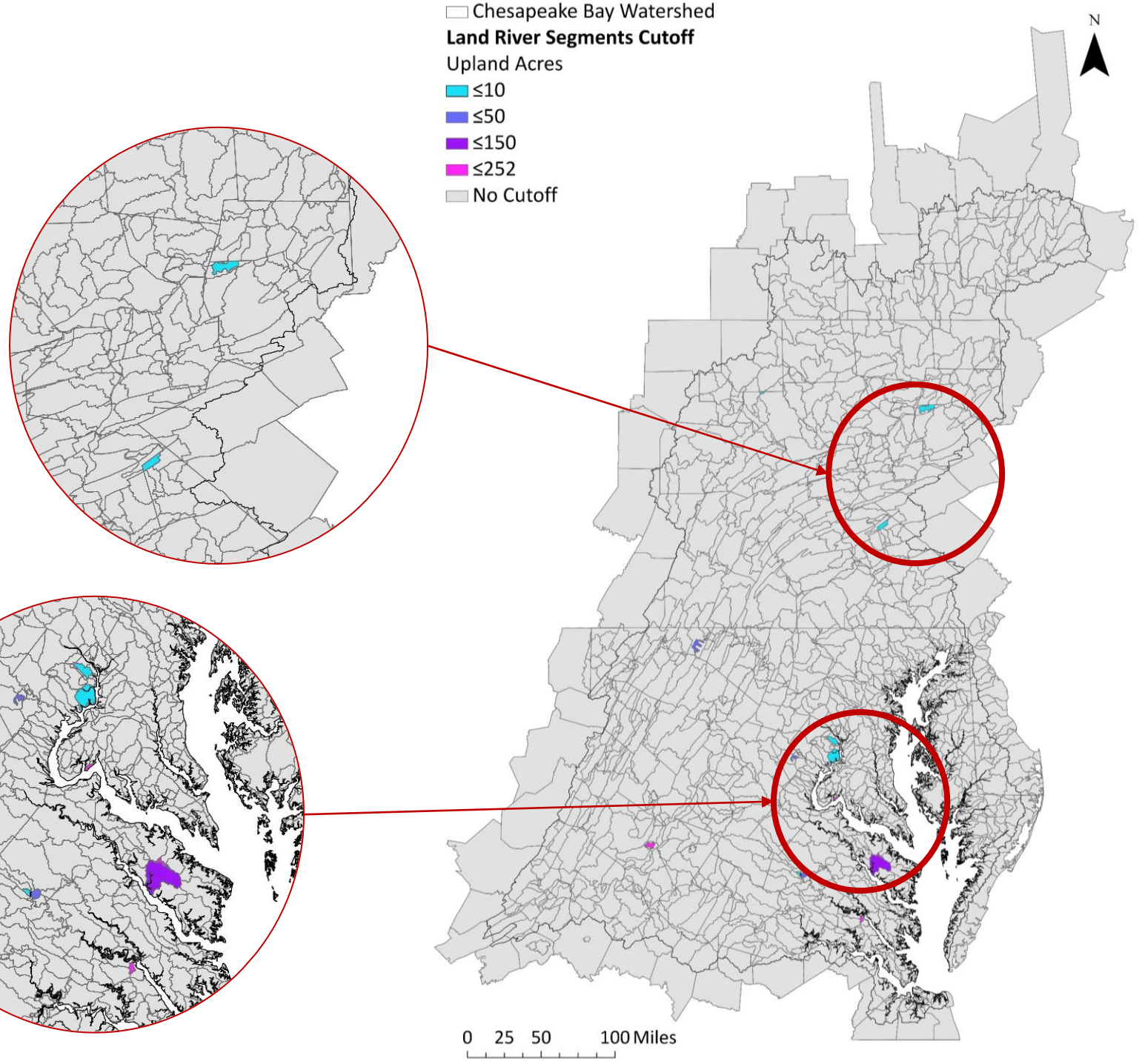
	A	B	C	D	E	F
1						
2	Unit	Acres				
3						
4	**Sum of Excess**	**Column Labels**				
5	**Row Labels**	**Tillage Management-Conservation**	**Tillage Management-Continuous High Residue**	**Tillage Management-Low Residue**	**Grand Total**	
6	h24023pu2_4720_4750(cbws)	846.67	2,822.25		3,668.92	
7	h24023pu3_4451_4450(cbws)	62.68	208.93		271.61	
8	n10001de0_3380_0000(outofcbws)	3,190.71	2,493.51	3,338.36	9,022.58	
9	n10001de0_3410_0000(outofcbws)	7,858.96	6,141.71	8,222.62	22,223.29	
10	n10001de0_3790_0000(outofcbws)	4,357.72	3,405.52	4,559.36	12,322.59	
11	n10001de0_3791_0001(outofcbws)	1,940.35	1,516.37	2,030.14	5,486.85	
12	n10001de0_3840_0000(outofcbws)	2,060.29	1,610.10	2,155.62	5,826.00	
13	n10001de0_4140_0000(outofcbws)	9,170.97	7,167.03	9,595.34	25,933.34	
14	n10001de0_4141_0001(outofcbws)	2,171.94	1,697.35	2,272.44	6,141.74	
15	n10001de0_4230_0000(outofcbws)	2,890.04	2,258.54	3,023.77	8,172.35	
16	n10001de0_4231_0001(outofcbws)	476.11	372.07	498.14	1,346.31	
17	n10001el0_4560_4562(cbws)	1,292.81	1,010.32	1,352.63	3,655.75	
18	n10001el2_4400_4590(cbws)	6,016.53	4,701.87	6,294.93	17,013.33	
19	n10001el2_4590_0001(cbws)	1,628.13	1,272.37	1,703.47	4,603.96	
20	n10001em2_3980_0001(cbws)	7,113.72	5,559.31	7,442.89	20,115.92	
21	n10001em3_4326_0000(cbws)	2,761.67	2,158.22	2,889.46	7,809.35	
22	n10001eu2_3520_0001(cbws)	2,546.18	1,989.82	2,664.00	7,200.00	
23	n10003de0_2590_0000(outofcbws)	0.66	0.53	0.74	1.93	
24	n10003de0_2600_0000(outofcbws)	191.02	154.67	214.59	560.29	
25	n10003de0_2610_0000(outofcbws)	1.26	1.02	1.42	3.71	
26	n10003de0_2640_0000(outofcbws)	126.24	102.21	141.81	370.26	
27	n10003de0_2690_0000(outofcbws)	126.85	102.71	142.50	372.05	
28	n10003de0_2710_0000(outofcbws)	316.86	256.57	355.95	929.38	
29	n10003de0_2800_0000(outofcbws)	11.28	9.13	12.67	33.08	
30	n10003de0_2850_0000(outofcbws)	152.45	123.44	171.25	447.14	
31	n10003de0_2870_0000(outofcbws)	0.01	0.00	0.01	0.01	
32	n10003de0_2920_0000(outofcbws)	336.18	272.21	377.65	986.05	
33	n10003de0_2960_0000(outofcbws)	481.47	389.85	540.86	1,412.18	
34	n10003de0_2990_0000(outofcbws)	2,838.16	2,298.09	3,188.28	8,324.53	

Upland Acres BMPs

- Forest Buffer Upland Acres
- Grass Buffer Upland Acres
- Wetland Upland Acres

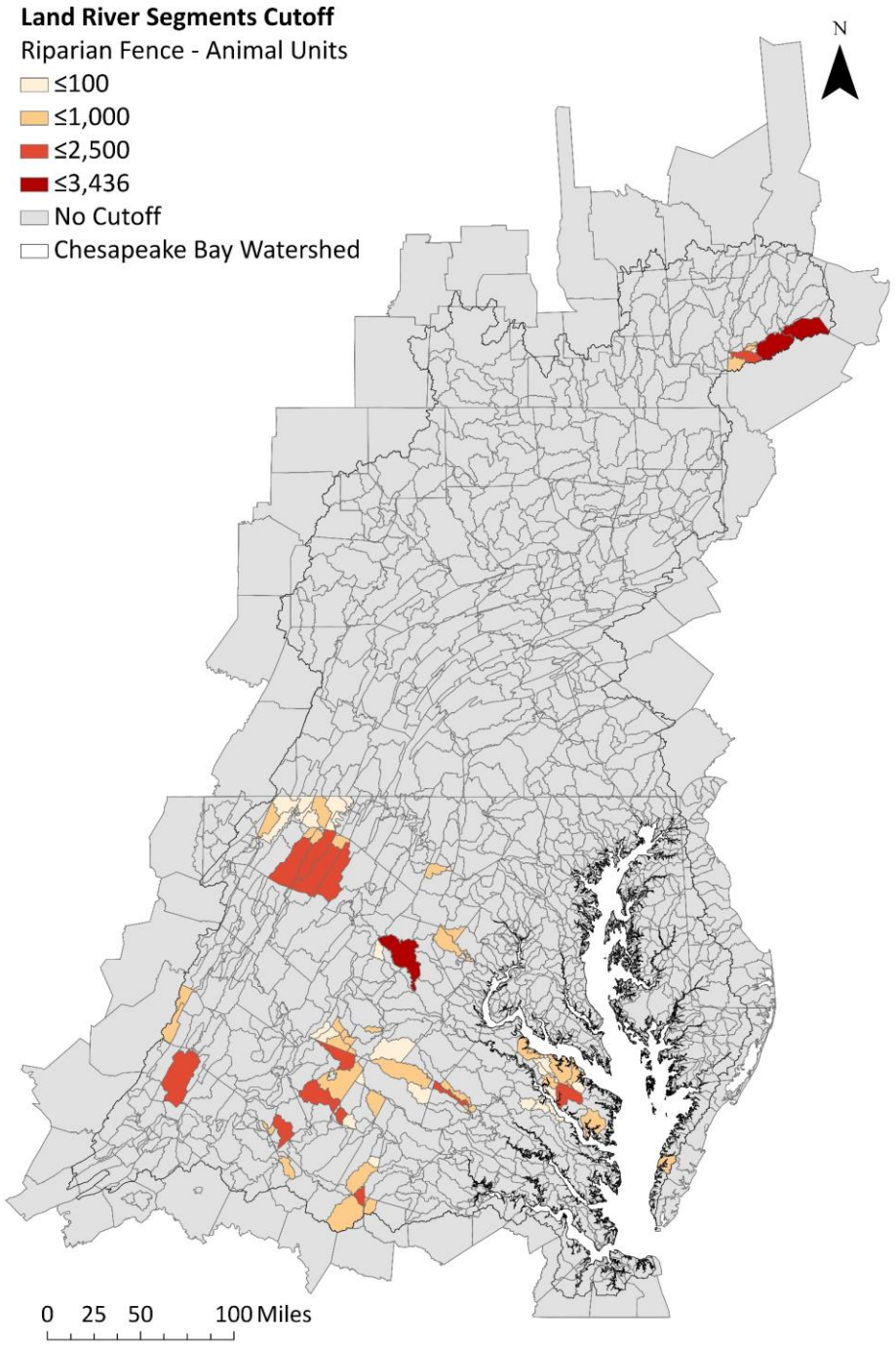
Notes:

- Excess Amount: >1,000 acres
- Amount implemented in 2020: 618,552 acres (0.2% Excess)
- Upland acres are credited as an efficiency BMP to land use surrounding riparian buffers and wetlands.
- Occurring in small LRS



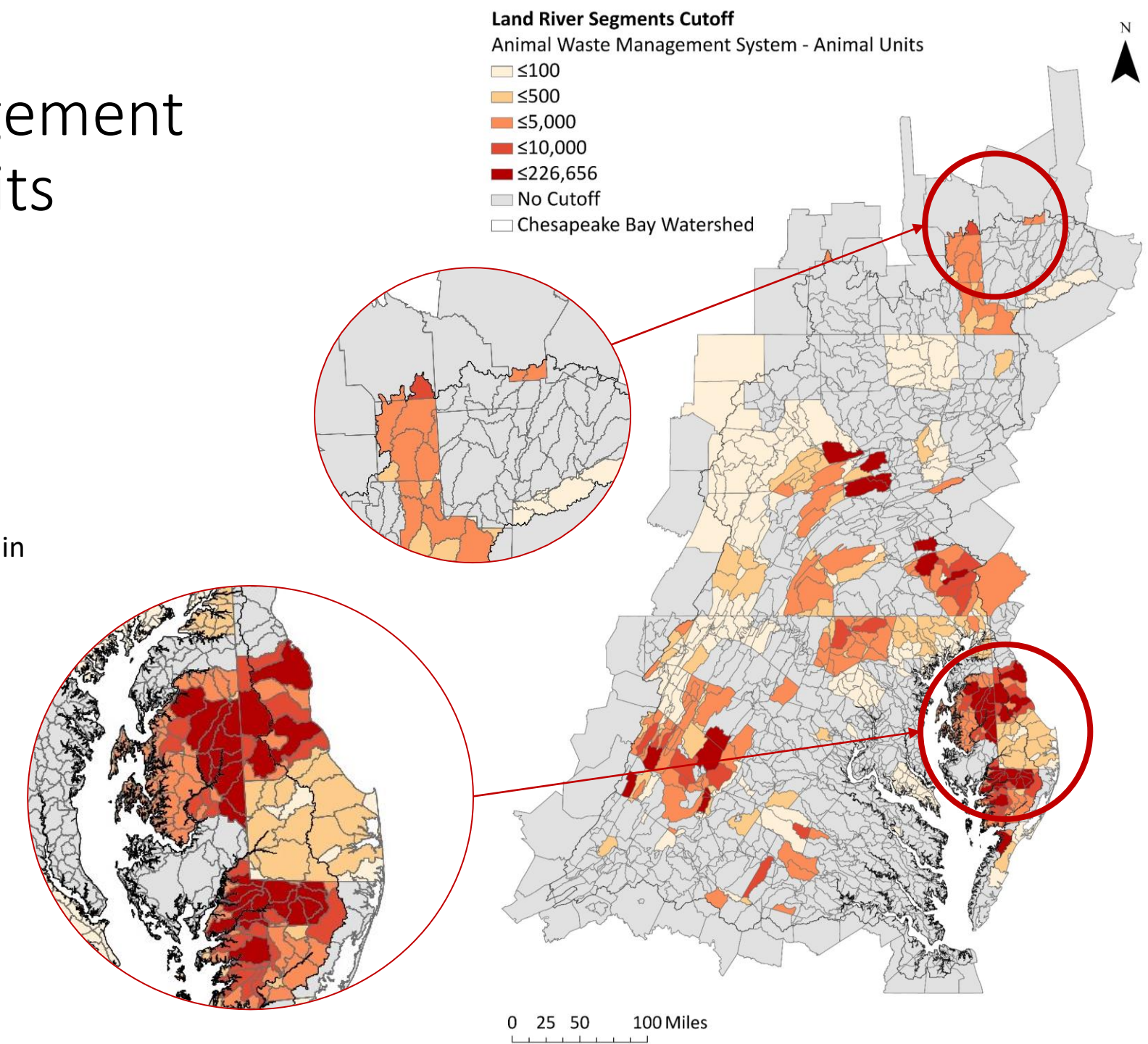
Riparian Fence – Animal Units

- Riparian Fence is used to reduce animal nutrients when reporting exclusion fence BMPs
- Excess Amount: 47,039 animal units
- Amount implemented in 2020: 381,567 animal units (11% Excess)
- Only reported within watershed
- Excess in counties that have a small portion in the watershed
- Occurring in NY, VI, WV



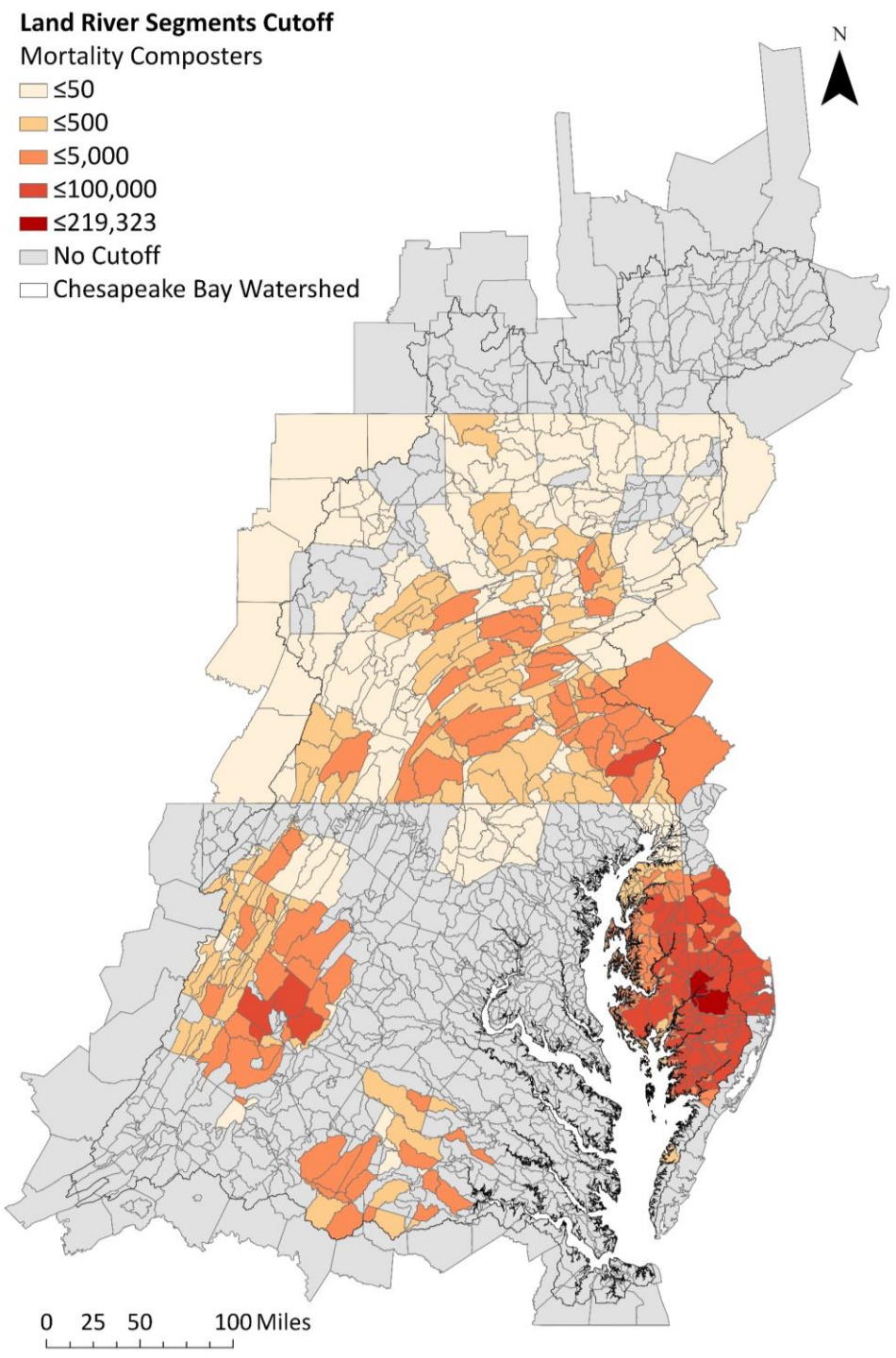
Animal Waste Management Systems – Animal Units

- Excess Amount: 1,719,085 animal units in watershed
- Amount implemented in 2020: 4,693,535 animal units in watershed (37% excess)
- Excess distributed across watershed
- Excess in counties that have a small portion in the watershed
- BMP reported outside and inside of the watershed by some jurisdictions



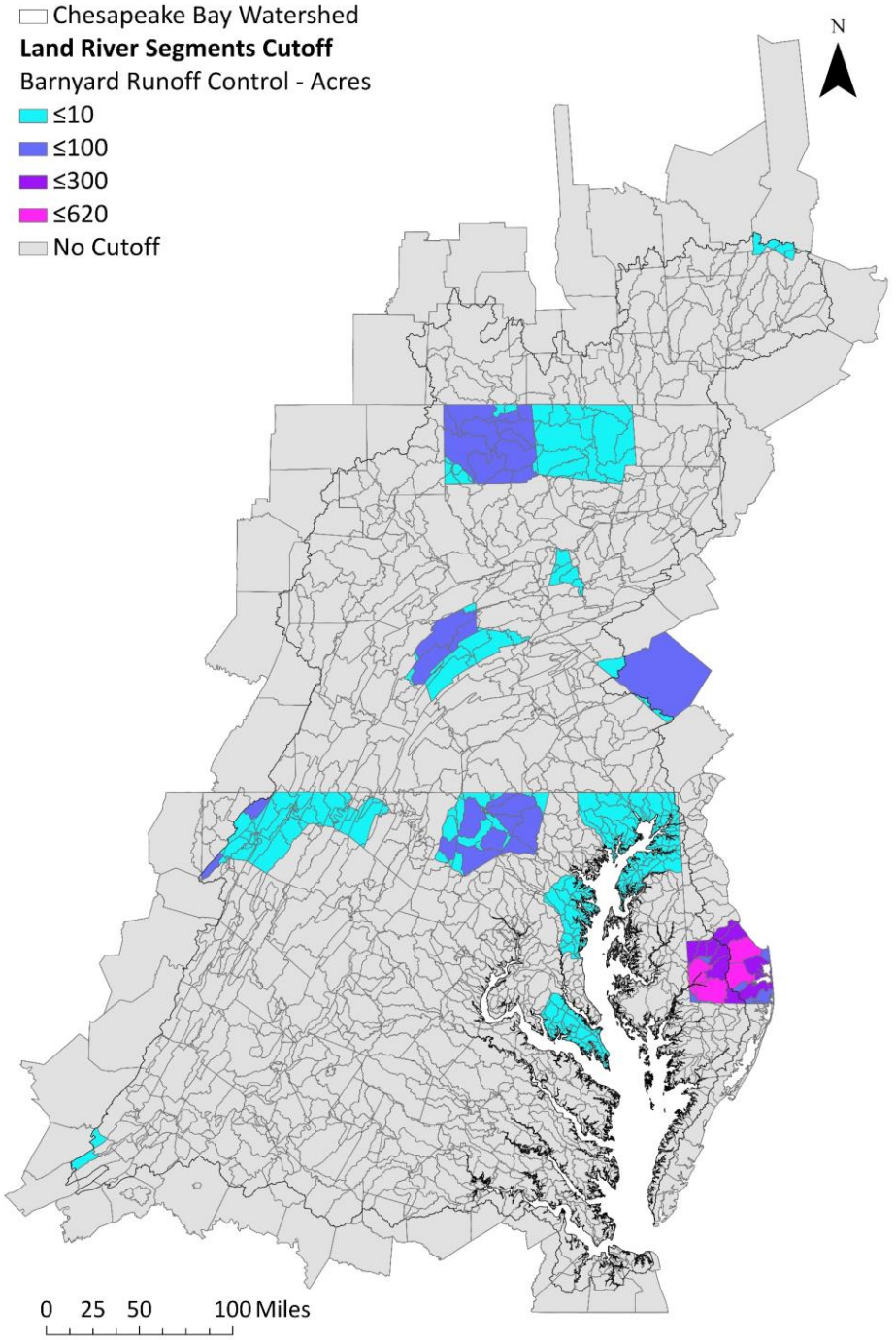
Mortality Composters – Animal Units

- Excess Amount: 1,753,023 animal units in watershed
- Amount implemented in 2020: 277,174 (86% excess)
- BMP reported outside and inside of the watershed
- Excess Distributed across watershed
- Excess in counties that have a small portion in the watershed



Barnyard Runoff Control – Acres

- Excess Amount: 3,259 acres in watershed
- Amount Implemented in 2020: 6,341 acres in watershed (34% excess)
- BMP reported outside and inside of the watershed
- Excess in counties that have a small portion in the watershed
- Excess Distributed across watershed
- BMP load source is feeding space. Feeding space in the model is determined by…..



Stormwater Practices

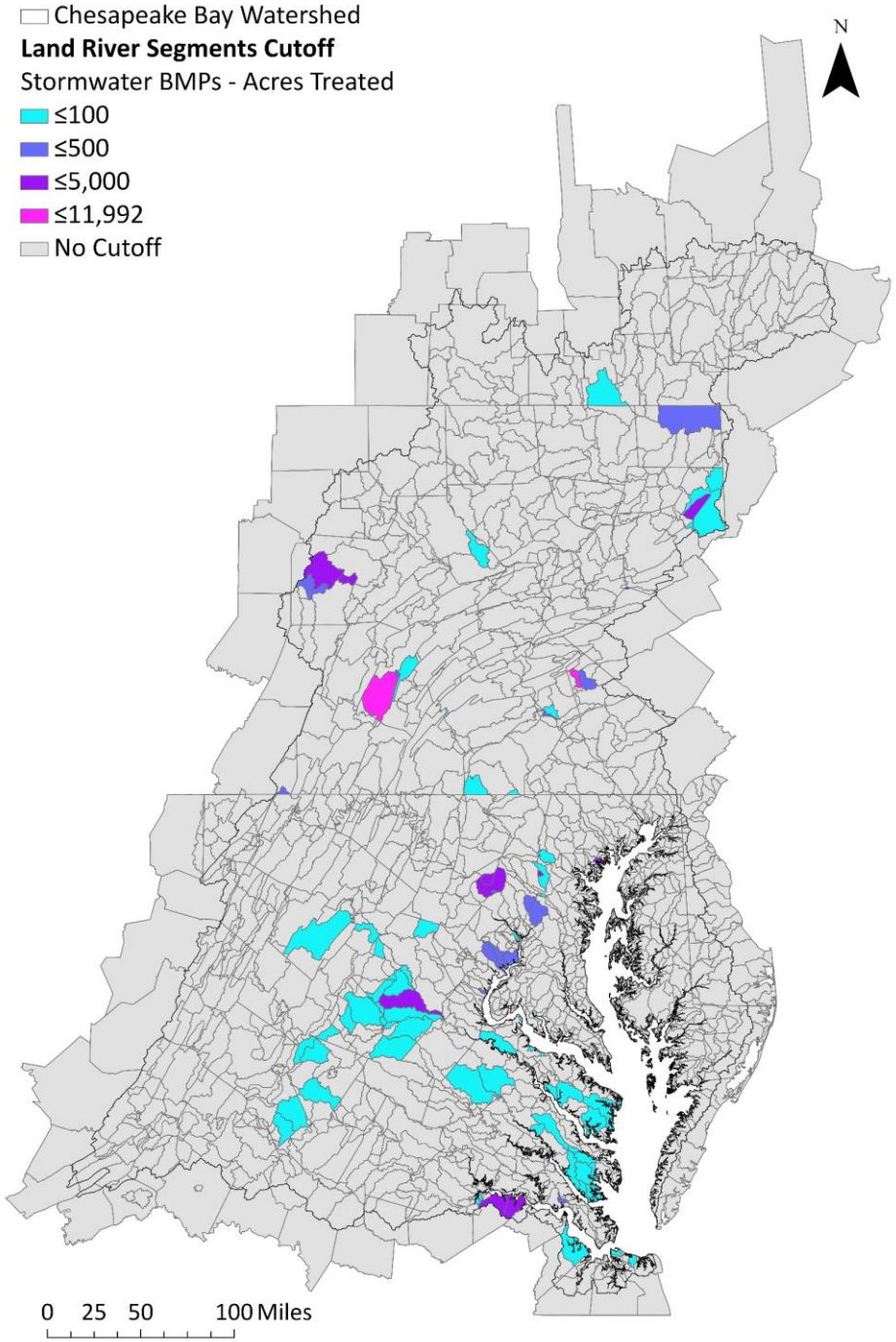
Acres Treated

- Bioretention/raingardens
- Bioswale
- Dry Detention Ponds and Hydrodynamic Structures
- Dry Extended Detention Ponds
- Filtering Practices
- Infiltration Practices
- Permeable Pavement
- Stormwater Performance Standard-Runoff Reduction
- Stormwater Performance Standard-Stormwater Treatment
- Vegetated Open Channels
- Wet Ponds and Wetlands

Notes:

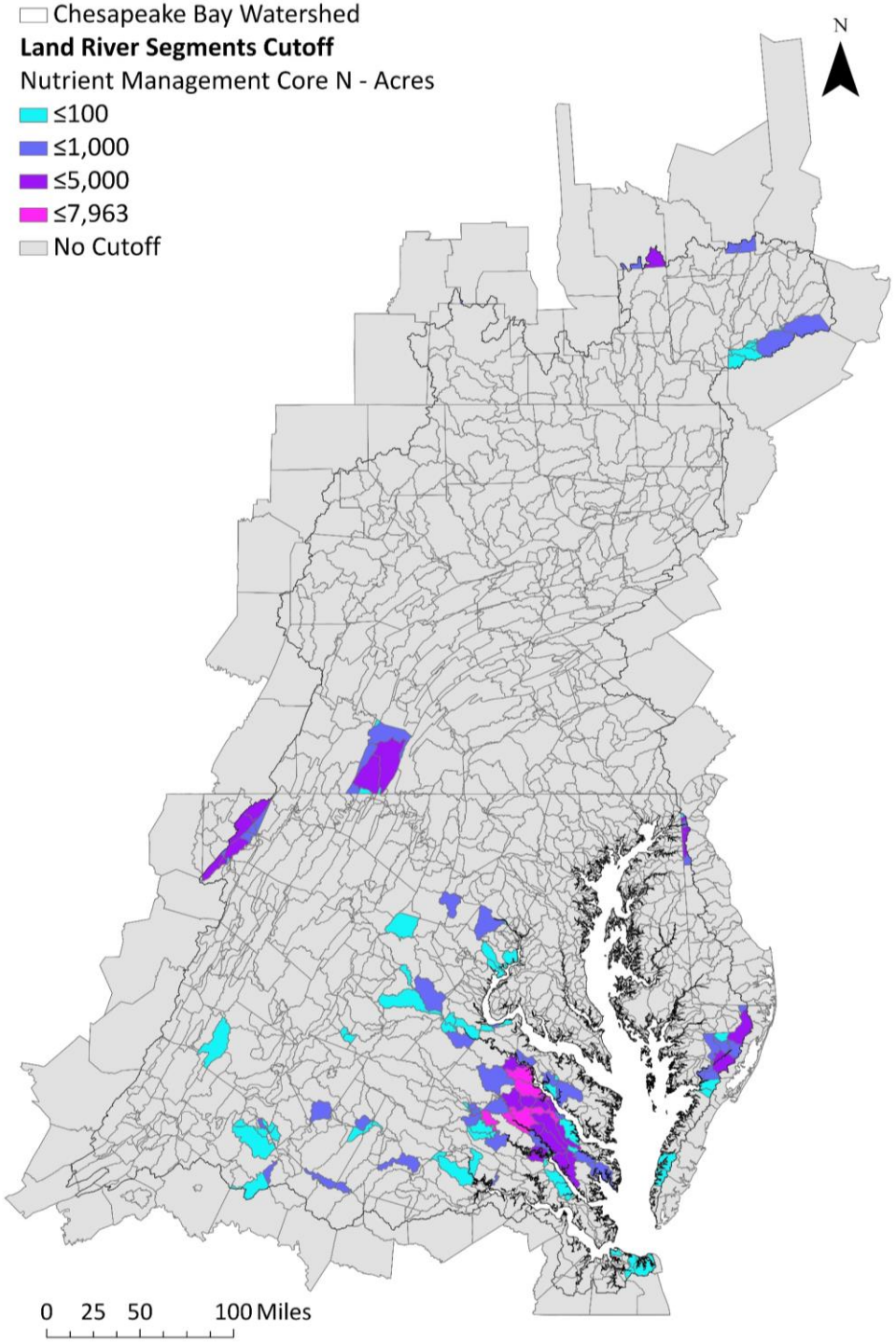
- Excess Amount: 43,650 acres
- Amount implemented in 2020: 703,080 acres (6% excess)

- Mostly reported using LRS or lat/long. Are center points for county or HUC area being used when exact coordinates are unknown?



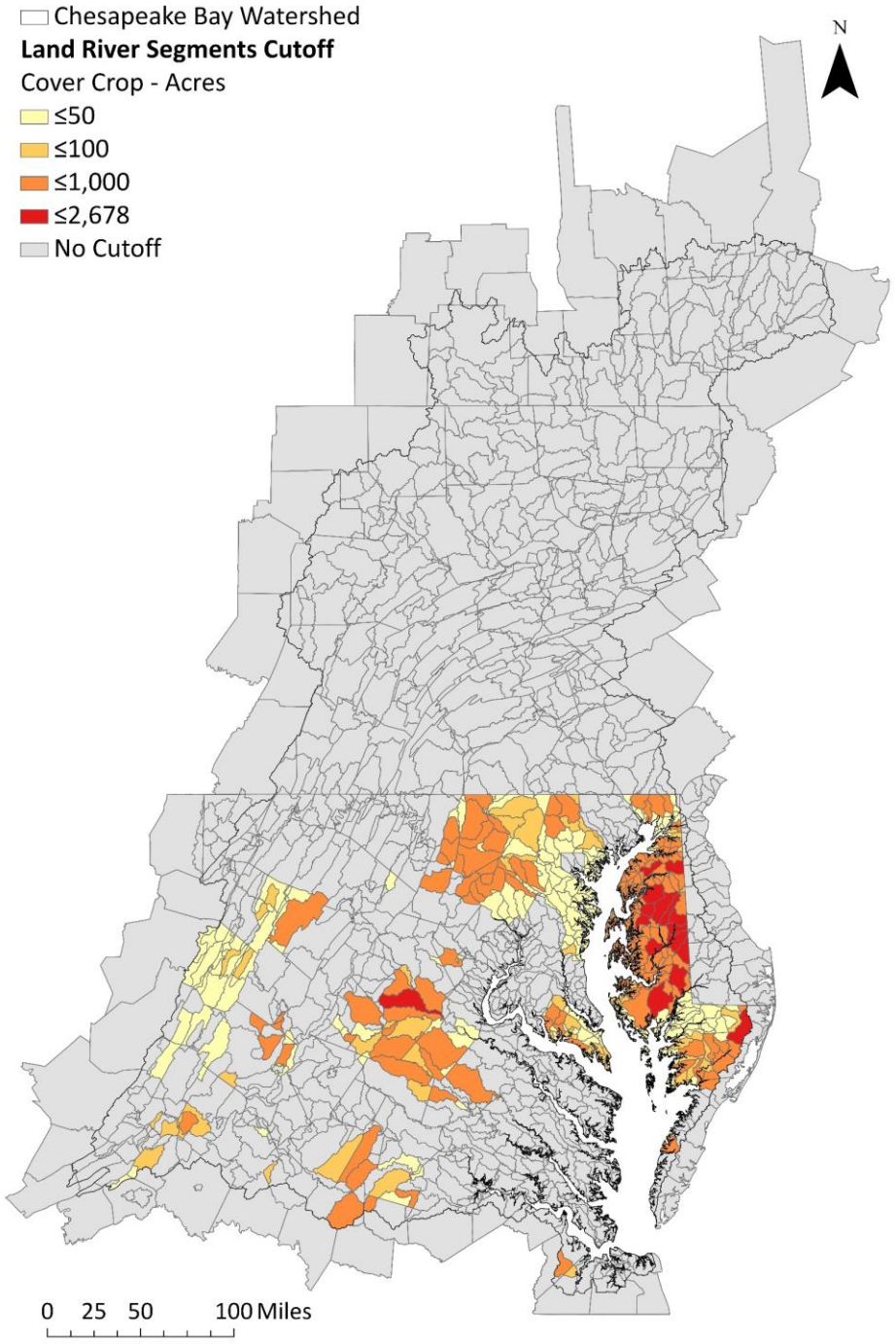
Nutrient Management Plan - Core Nitrogen

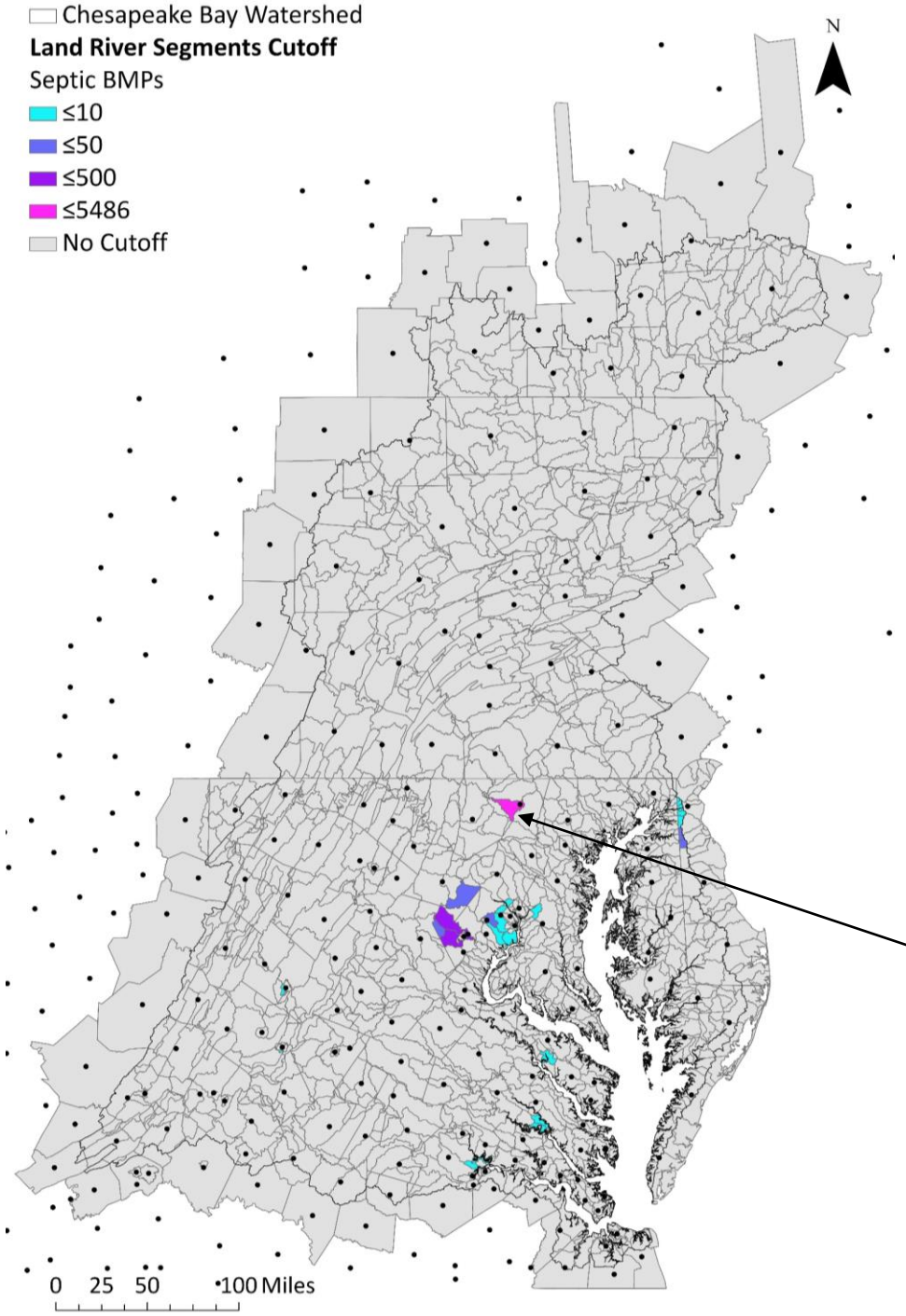
- Excess Amount: 111,223 acres
- Amount implemented in 2020: 2,121,212 acres (5% excess)
- Cutoff in counties that have a small portion in the watershed
- Occurring in DE, MD, NY, VA, WV



Cover Crops - Acres

- Excess Amount: 81,444 acres
- Amount implemented in 2020: 1,151,439 acres (7% excess)
- Occurring in MD, VA, and WV





Septic System BMPs

Septic BMPs

- Septic Connection
- Septic Denitrification
- Septic Effluent - Enhanced
- Septic Pumping
- Septic Secondary Treatment

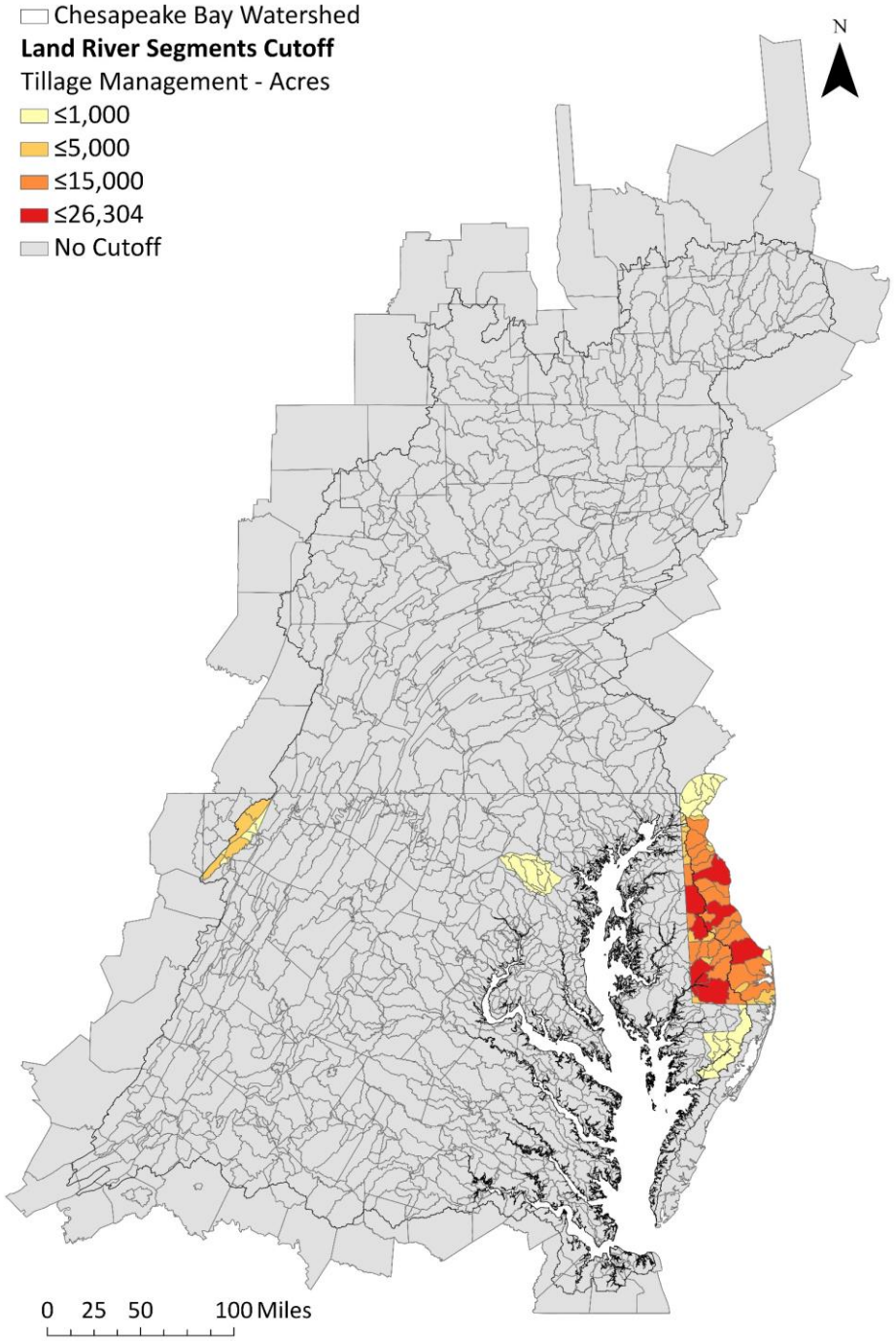
Excess Amount: 5,807 systems
Amount implemented in 2020: 65,901 systems (8% excess)
Occurring in DE, MD, VA

There are 5,486 septic systems being cutoff in one LRS.

- Was the data submitted as a coordinate center point instead of at a larger scale (e.g., county)?
- Is the baseline for septic systems in the LRS incorrect?

Tillage Management

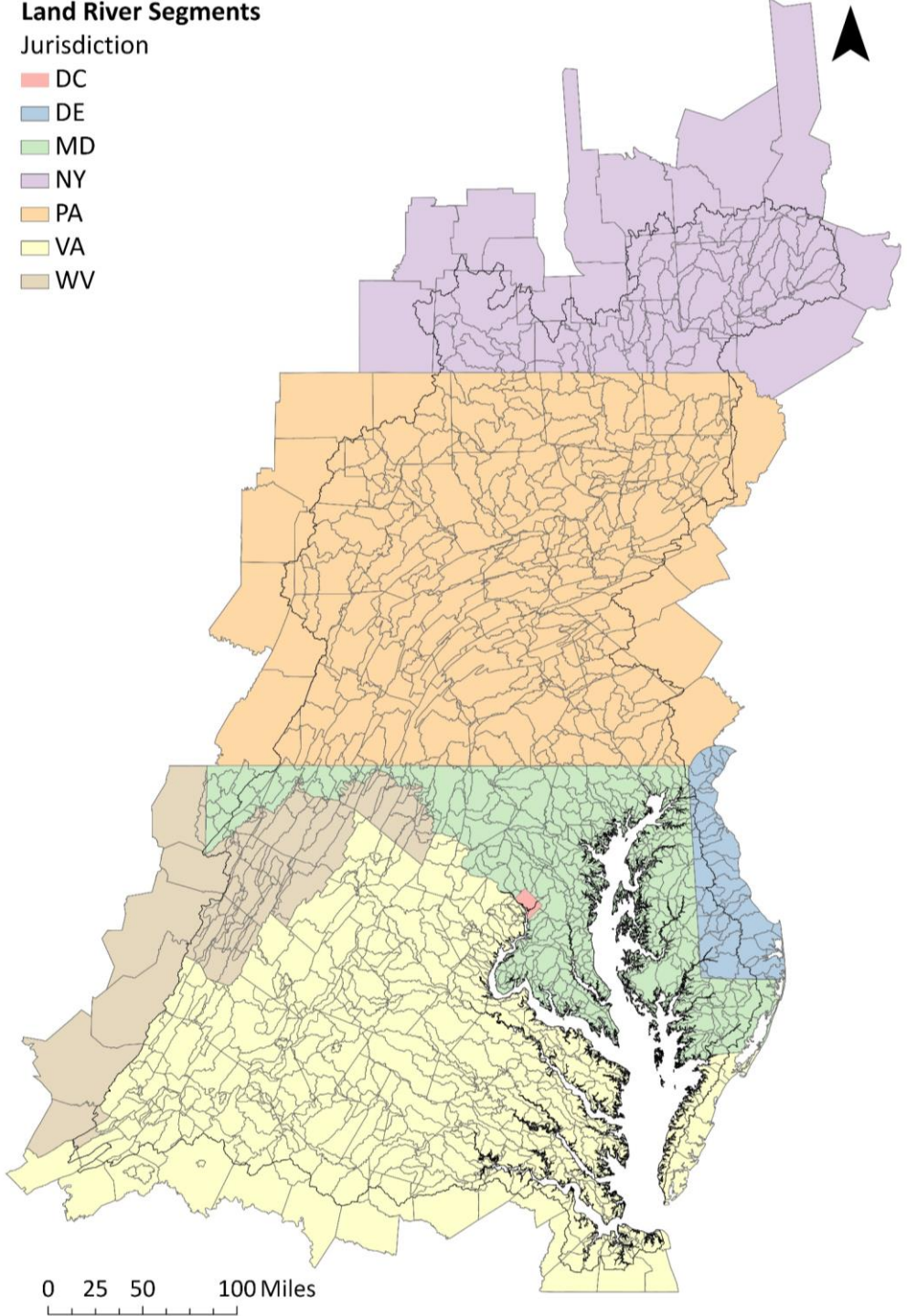
- Excess Amount: 184,646 acres
- Amount implemented in 2020: 2,992,475 acres (6% excess)
- Cutoff in counties that have a small portion in the watershed
- Occurring in MD, VA, and WV



Excess Alleviations/Solutions

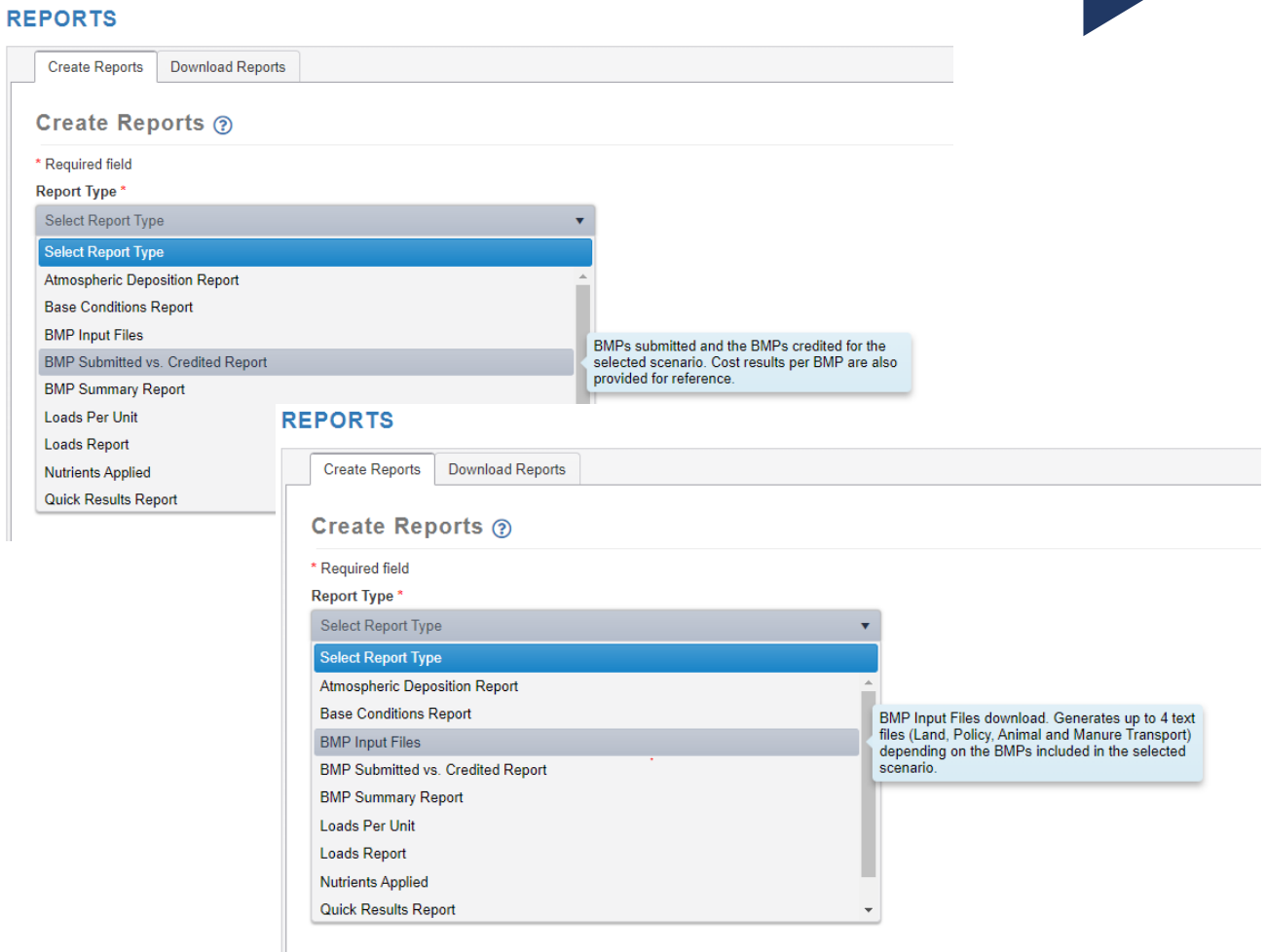
- Reporting BMPs on correct scale by avoiding coordinate center points for counties/watersheds when the exact coordinates are unknown.
- Report BMPs correctly as CBWSOnly where applicable.
- BMP verification may decrease over-reporting if it is occurring.
- If a jurisdiction is reporting BMPs that occurred within the watershed (CBWS-Only), the actual implementation may be larger than how the land use is distributed proportionally in the model.
  - e.g., A county that has a small amount of area in the watershed may have a CAFO operation that has more animals on it that were proportionally distributed in the model.
  - A possible solution would be to spread out that implementation at the next largest scale. This would be a solution for jurisdictions that report BMPs only within the watershed.
- Reporting BMPs with accurate implementation dates.
- Providing data to support any suspected inaccuracies in the partnership's base conditions:
  - **For excess with animal numbers**, states may report 1) Permitted/Non-permitted animal fractions, and 2) Animal fractions of county in land-river segments.
  - **For excess in manure transport**, states should ensure "wet" vs "dry" (moisture content) is accurate.
  - **For septic BMPs**, states can work with the CBPO to provide accurate septic numbes, including sewer boundaries, human population counts, and septic connection elimination, for future versions of the model (rather than rely on partnership defaults).

Map for reference



2020 Progress Excess Occurring by Jurisdiction

- CAST Submitted vs Credited Report
  - Only BMPs that were in excess.
- CAST BMP Input Files Report
  - How the BMPs are being reported:
    - Scale
    - Agency
    - Land Use



Delaware

BMP	Scale Reported	Load Source Reported	Agency
Barnyard Runoff Control	HUC (CBWS), County, State	Feed	Non-Fed
Forest Harvesting Practices	HUC (CBWS), County (CBWS)	Harvested Forest	Non-Fed
Nutrient Management Core N	HUC, County (CBWS)	row	Non-Fed
Nutrient Management Core P	HUC, County (CBWS)	row	Non-Fed
Septic Denitrification - Conventional	LRS, County (CBWS) State, State (CBWS)	septic	Non-Fed
Septic Pumping	County (CBWS)	septic	Non-Fed
Soil Conservation and Water Quality Plans	HUC, County, State	Ag	Non-Fed
Tillage Management-Conservation	County	row	Non-Fed
Tillage Management-Continuous High Residue	County	row	Non-Fed
Tillage Management-Low Residue	County	row	Non-Fed

BMP	Scale Reported	Load Source Reported	Agency
Animal Waste Management System	HUC, County, State	all animals, livestock, poultry	Non-Fed
Mortality Composters	HUC, County	poultry	Non-Fed

Maryland 1/2

BMP	Scale Reported	Load Source Reported	Agency
Bioretention/raingardens - A/B soils, underdrain	LRS	Impervious	DOD, GSA, Non-Fed
Bioretention/raingardens - C/D soils, underdrain	LRS	Impervious	DOD, GSA, Non-Fed
Bioswale	State (CBWS), County (CBWS), LRS	MS4cssnonregulated	DOD, Fed Other, Non-Fed
Dry Detention Ponds and Hydrodynamic Structures	LRS, County (CBWS), State (CBWS)	MS4cssnonregulated	DOD, Fed Other, GSA, NASA, Non-Fed
Dry Extended Detention Ponds	LRS, County (CBWS), State (CBWS)	MS4cssnonregulated	DOD, Fed Other, FWS, GSA, NASA, Non-Fed
Filtering Practices	LRS, County (CBWS), State (CBWS)	MS4cssnonregulated	DOD, Fed Other, GSA, Non-Fed
Infiltration Practices w/ Sand, Veg. - A/B soils, no underdrain	LRS, County (CBWS), State (CBWS)	MS4cssnonregulated	Non-Fed
Infiltration Practices w/o Sand, Veg. - A/B soils, no underdrain	LRS, County (CBWS), State (CBWS)	MS4cssnonregulated	DOD, Non-Fed
Mechanical Broom Technology - 1 pass/4 weeks	LRS	roads	DOD, Non-Fed
Septic Connection	LRS, County (CBWS)	septic	Non-Fed
Septic Denitrification - Conventional	LRS, County (CBWS)	septic	Non-Fed
Septic Pumping	LRS	septic	Non-Fed
Stormwater Performance Standard-Runoff Reduction	LRS, County (CBWS), State (CBWS)	MS4cssnonregulated	DOD, Fed Other, GSA, NASA, Non-Fed
Stormwater Performance Standard-Stormwater Treatment	LRS, County (CBWS), State (CBWS)	MS4cssnonregulated	DOD, NASA, Non-Fed
Tree Planting - Canopy	LRS, County (CBWS)	turfgrass	DOD, Fed Other, GSA, Non-Fed
Urban Shoreline Management	LRS, County (CBWS)	shoreline	DOD, Non-Fed
Wet Ponds and Wetlands	LRS, County (CBWS), State (CBWS)	MS4cssnonregulated	DOD, Fed Other, NASA, Non-Fed

Maryland 2/2

BMP	Scale Reported	Load Source Reported	Agency
Barnyard Runoff Control	County (CBWS)	Feed	Non-Fed
Cover Crop Commodity	County (CBWS)	Smallgrainsanddoublecrops	Non-Fed
Cover Crop Traditional	County (CBWS)	row	Non-Fed
Forest Harvesting Practices	County (CBWS)	harvested forest	Non-Fed
Loafing Lot Management	County (CBWS)	Feed	Non-Fed
Mechanical Broom Technology - 1 pass/4 weeks	LRS	roads	DOD, Non-Fed
Nutrient Management Core N	County (CBWS)	crophay, pasture	Non-Fed
Nutrient Management Core P	County (CBWS)	crophay, pasture	Non-Fed
Tillage Management-Conservation	County (CBWS)	row	Non-Fed
Tillage Management-Continuous High Residue	County (CBWS)	row	Non-Fed

BMP	Scale Reported	Load Source Reported	Agency Code
Animal Waste Management System	County (CBWS)	Beef, dairy, goats, horses, livestock, poultry, sheep and lambs, swine	Non-Fed
Mortality Composters	County (CBWS)	livestock, poultry	Non-Fed

New York

BMP	Scale Reported	Load Source Reported	Agency Code
Barnyard Runoff Control	County (CBWS)	Feed	Non-Fed
Bioretention/raingardens - A/B soils, underdrain	County	ms4cssnonregulated	DOD
Erosion and Sediment Control Level 2	LRS, County	Con	Non-Fed
Infiltration Practices w/ Sand, Veg. - A/B soils, no underdrain	County, LRS	ms4cssnonregulated	DOD, Non-Fed
Nutrient Management Core N	County (CBWS)	legumehay, pasture, row	Non-Fed
Nutrient Management Core P	County (CBWS)	legumehay, pasture, row	Non-Fed
Nutrient Management N Placement	County (CBWS)	legumehay, pasture, row	Non-Fed
Nutrient Management N Rate	County (CBWS)	legumehay, pasture, row	Non-Fed
Nutrient Management N Timing	County (CBWS)	legumehay, pasture, row	Non-Fed
Nutrient Management P Placement	County (CBWS)	legumehay, pasture, row	Non-Fed
Nutrient Management P Rate	County (CBWS)	legumehay, pasture, row	Non-Fed
Nutrient Management P Timing	County (CBWS)	legumehay, pasture, row	Non-Fed

BMP	Scale Reported	Load Source Reported	Agency Code
Animal Waste Management System	County (CBWS)	Beef, dairy, horses, livestock, sheep and lambs, swine	Non-Fed
Dairy Precision Feeding	County (CBWS)	dairy	Non-Fed

Pennsylvania

BMP	Scale Reported	Load Source Reported	Agency Reported
Barnyard Runoff Control	LRS, County, State	Feed	Non-Fed
Dry Detention Ponds and Hydrodynamic Structures	LRS, County	ms4cssnonregulated	DOD
Dry Extended Detention Ponds	County	ms4cssnonregulated	DOD, Non-Fed
Erosion and Sediment Control Level 1	LRS	Construction	DOD
Forest Harvesting Practices	LRS, County, State	Harvested forest	DOD, Non-Fed
Infiltration Practices w/ Sand, Veg. - A/B soils, no underdrain	LRS	ms4cssnonregulated	DOD, Non-Fed
Loafing Lot Management	LRS, County, State	Feed	Non-Fed
Mechanical Broom Technology - 1 pass/4 weeks	LRS, County	Roads	DOD
Nutrient Management Core N	State, County	Row	Non-Fed
Off Stream Watering Without Fencing	LRS, County, State	Pasture	Non-Fed
Soil Conservation and Water Quality Plans	LRS, County, State	Ag	Non-Fed
Stormwater Performance Standard-Runoff Reduction	LRS, County	ms4cssnonregulated	DOD, Non-Fed
Stormwater Performance Standard-Stormwater Treatment	LRS, County	ms4cssnonregulated	DOD, Non-Fed
Wet Ponds and Wetlands	LRS, County	ms4cssnonregulated	DOD, Non-Fed

BMP	Scale Reported	Load Source Reported	Agency Code
Animal Waste Management System	LRS, County, State	All animals, beef, broilers, dairy, layers, livestock, poultry, pullets, sheep and lambs, swine	Non-Fed
Mortality Composters	LRS, County, State	poultry	Non-Fed

Virginia 1/2

BMP	Scale Reported	Load Source Reported	Agency Reported
Bioretention/raingardens - A/B soils, underdrain	LRS, HUC, County	Impervious, ms4css, ms4cssimpervious, ms4cssnonregulated, ms4csspervious	DOD, Fed Other, Non-Fed
Bioretention/raingardens - C/D soils, underdrain	LRS, HUC, County	Impervious, ms4css, ms4cssnonregulated	DOD, Non-Fed
Bioswale	LRS, HUC, County	ms4css, ms4cssimpervious, ms4cssnonregulated	DOD, Non-Fed
Dirt & Gravel Road Erosion & Sediment Control - Driving Surface Aggregate with Outlets	County	roads, ms4cssnonregulated	FWS, NPS
Dry Detention Ponds and Hydrodynamic Structures	LRS, HUC, County, State	ms4cssnonregulated, ms4css	DOD, Fed Other, Non-Fed, NPS
Dry Extended Detention Ponds	LRS, HUC, County	ms4css, ms4cssimpervious, ms4cssnonregulated, nonregulated	DOD, Fed Other, Non-Fed
Erosion and Sediment Control Level 2	HUC	construction	Non-Fed
Filtering Practices	LRS, HUC, County	ms4css, ms4cssnonregulated, ms4cssimpervious	DOD, NASA, Non-Fed
Forest Planting	LRS, HUC, County	turfgrass, ms4css, ms4csspervious	DOD, FWS, NASA, Non-Fed, NPS
Impervious Surface Reduction	LRS, HUC, County, State	Impervious, ms4css, ms4cssimpervious, ms4csspervious	DOD, FWS, NASA, Non-Fed
Infiltration Practices w/ Sand, Veg. - A/B soils, no underdrain	LRS, HUC, County	ms4css, ms4cssnonregulated	DOD, Fed Other, Non-Fed
Infiltration Practices w/o Sand, Veg. - A/B soils, no underdrain	LRS, HUC, County	ms4css, ms4cssnonregulated	DOD, Fed Other, Non-Fed
Nutrient Management Plan Low Risk Lawn	LRS	pervious	DOD
Permeable Pavement w/ Sand, Veg. - A/B soils, no underdrain	LRS, HUC, County	ms4css, ms4cssImpervious, ms4cssnonregulated	DOD, Non-Fed
Permeable Pavement w/ Sand, Veg. - C/D soils, underdrain	LRS, HUC, County	ms4css, ms4cssnonregulated	DOD, NASA, Non-Fed
Precision Intensive Rotational/Prescribed Grazing	HUC, County, State	pasture	Non-Fed
Stormwater Performance Standard-Runoff Reduction	LRS, HUC, County	ms4css, ms4csspervious, ms4cssimpervious, ms4cssnonregulated, nonregulatedimpervious	DOD, NASA, Non-Fed
Stormwater Performance Standard-Stormwater Treatment	LRS, HUC, County	ms4css, ms4cssnonregulated, nonregulatedimpervious	DOD, Non-Fed
Vegetated Open Channels - A/B soils, no underdrain	LRS, HUC, County	ms4css, ms4cssnonregulated	DOD, FWS, Non-Fed
Wet Ponds and Wetlands	LRS, HUC, County, State	ms4css, ms4csspervious, ms4cssimpervious, ms4cssnonregulated	DOD, Fed Other, FWS, Non-Fed

Virginia 2/2

BMP	Scale Reported	Load Source Reported	Agency Reported
Cover Crop Commodity	HUC	Small grains and double crops	Non-Fed
Cover Crop Traditional	HUC	row	Non-Fed
Forest Harvesting Practices	County, State	harvested forest	Fed Other, Non-Fed
Grass Buffer	LRS, HUC, County, State	crophay, row	Non-Fed
Land Retirement to Ag Open Space	HUC, County, State	pasture, row	Non-Fed
Nutrient Management Core N	HUC	Hay, pasture, row, specialty	Non-Fed
Nutrient Management Core P	HUC	Hay, pasture, row, specialty	Non-Fed
Nutrient Management N Rate	HUC	row	Non-Fed
Nutrient Management N Timing	HUC, County, State	row	Non-Fed
Precision Intensive Rotational/Prescribed Grazing	HUC, County, State	pasture	Non-Fed
Septic Connection	LRS, HUC, County	septic	Non-Fed
Septic Denitrification - Conventional	LRS, HUC, County, State	septic	Non-Fed
Septic Denitrification - Enhanced	LRS, HUC, County, State	septic	Non-Fed
Septic Pumping	LRS, HUC, County	septic	Non-Fed
Septic Secondary Treatment - Conventional	LRS, HUC, County, State	septic	Non-Fed
Septic Secondary Treatment - Enhanced	LRS, County, State	septic	Non-Fed
Urban Shoreline Erosion Control Non-Vegetated	LRS, County, State	shoreline	Non-Fed
Wetland Creation - Floodplain	LRS	ag	Non-Fed

BMP	Scale Reported	Load Source Reported	Agency Code
Animal Waste Management System	HUC, County, State	beef, broilers, dairy, horses, layers, livestock, poultry, pullets, swine	Non-Fed
Mortality Composters	HUC, County, State	livestock, poultry	Non-Fed

West Virginia

BMP	Scale Reported	Load Source Reported	Agency Reported
Barnyard Runoff Control	county, state (CBWS)	feed	Non-Fed
Cover Crop Commodity Early	county, state (CBWS)	smallgrainsanddoublecrops	Non-Fed
Cover Crop Commodity Late	county	smallgrainsanddoublecrops	Non-Fed
Cover Crop Commodity Normal	county	smallgrainsanddoublecrops	Non-Fed
Cover Crop Traditional Rye Late Drilled	county	row	Non-Fed
Cover Crop Traditional Triticale Early Drilled	county	row	Non-Fed
Erosion and Sediment Control Level 2	county	construction	Non-Fed
Loafing Lot Management	county, county (CBWS), state (CBWS)	feed	Non-Fed

BMP	Scale Reported	Load Source Reported	Agency
Animal Waste Management System	County, County (CBWS), State (CBWS)	beef, broilers, dairy, goats, horses, layers, livestock, poultry, pullets, turkeys	Non-Fed
Mortality Composters	County	broilers, layers, poultry, pullets, turkeys	Non-Fed