



DELAWARE DEPARTMENT OF  
**AGRICULTURE**

## Delaware Special Case Scenario

Resulting loads from E3  
assumption change on streamside  
forest buffers.



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AGRICULTURE

## 4/5/18 Letter



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DEPARTMENT OF AGRICULTURE  
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KENNETH M. BOUNDS  
DEPUTY SECRETARY

April 5, 2018

James Edwards  
Acting Director  
EPA Chesapeake Bay Program  
410 Severna Ave  
Annapolis, MD 21403

RE: Allocation Methodology and Special Case Consideration

Dear Acting Director Edwards:

The State of Delaware has concluded the review of the allocation methodology and would like to put forth to the Chesapeake Bay Program Partnership a special case request. Delaware requests an additional **one million pounds of nitrogen and ten thousand pounds phosphorus** added to our statewide allocation to reflect more equitable assumptions for select scenarios utilized in the agreed upon allocation methodology.

During our review, Delaware noticed some inconsistencies between our agricultural simulation in the "Everything by Everyone Everywhere" (E3) Scenario and other states within the Chesapeake Assessment and Scenario Tool (CAST). First, our forested buffer BMP was set at 9.4%, much higher than the average of the other Bay states; which is 2.9%. Second our E3 Nutrient Management acres are the highest at 90.1%, with the other states sharing the Delmarva Peninsula being Maryland at 83.4% and Virginia at 56.5%.

To estimate our proposal, an E3 clone was created with BMPs replacing the Chesapeake Bay Program goals for Nutrient Management and Forested Buffer acres with 85% and 3% coverage, respectively. These replacement goals were chosen to be both aggressive, but more consistent with our partner states. This scenario in CAST yielded a significant difference between our E3 Edge of Stream loads and this new scenario. Specifically, this new scenario put our estimate for E3 almost 1 million pounds edge of stream higher in nitrogen, almost 10 thousand pounds in phosphorus, and almost 21 million pounds in sediment.

Delaware requests these considerations be made on our behalf by EPA in summary allocations and the proposal be brought before the Principles Staff Committee before the end of the special case request period expires.

Respectfully,

Michael T. Scuse  
Secretary

cc: Shawn Garvin, Secretary

# History

- Estimated lbs change in E3 that reduced 9.8% forest buffer assumption to 3%
- Included lbs from a change to NM – deemed miscommunication
- Total estimate at CAST edge of stream scale



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## Tax ditch visualization

### What is it?

A tax ditch is a governmental subdivision of the State.

1951 Gen. Assembly enacted drainage law establishing these organizations.

Courts rule on petitions to dig drainage ditches for public health, safety and welfare.

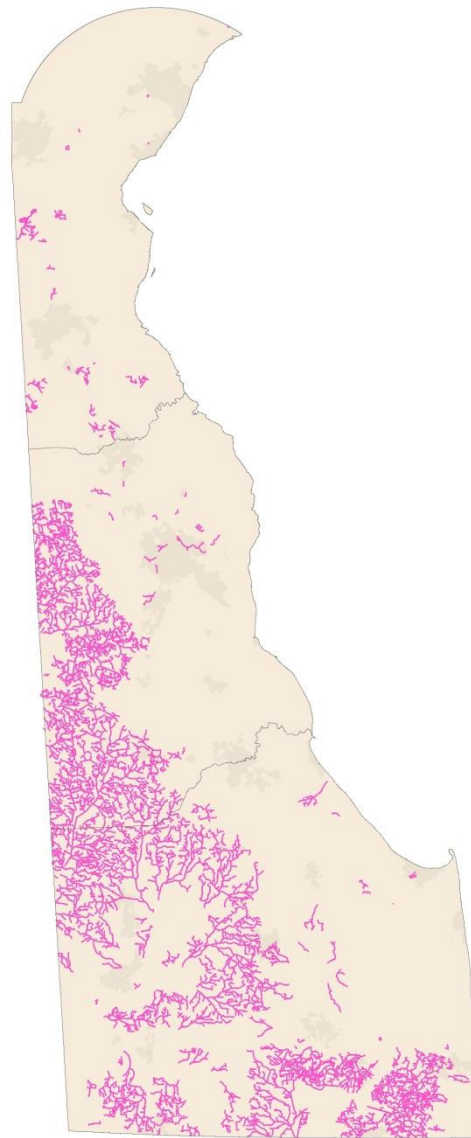
### How are they different from natural streams?

They are man-made and managed.  
Management requires frequent cleanouts.

BMPs can be installed to promote water quality, but these require enhanced maintenance and cost.

### Read more:

<http://www.dnrec.delaware.gov/swc/Drainage/Pages/TaxDitches.aspx>



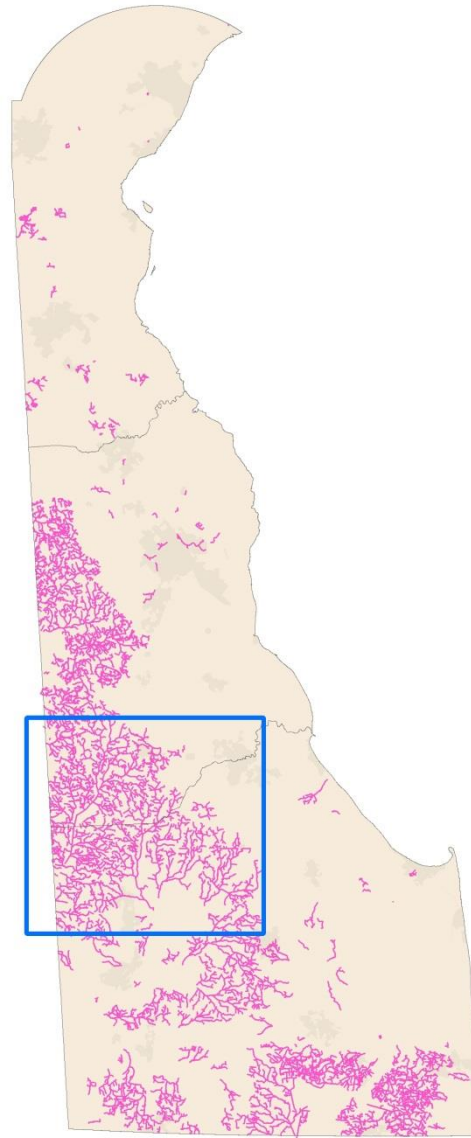
— Tax Ditch Channels  
0 5 10 15 Miles



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## Tax ditch visualization

Segment of southern Kent and  
northern Sussex counties draining  
to Chesapeake Bay



— Tax Ditch Channels  
0 5 10 15 Miles



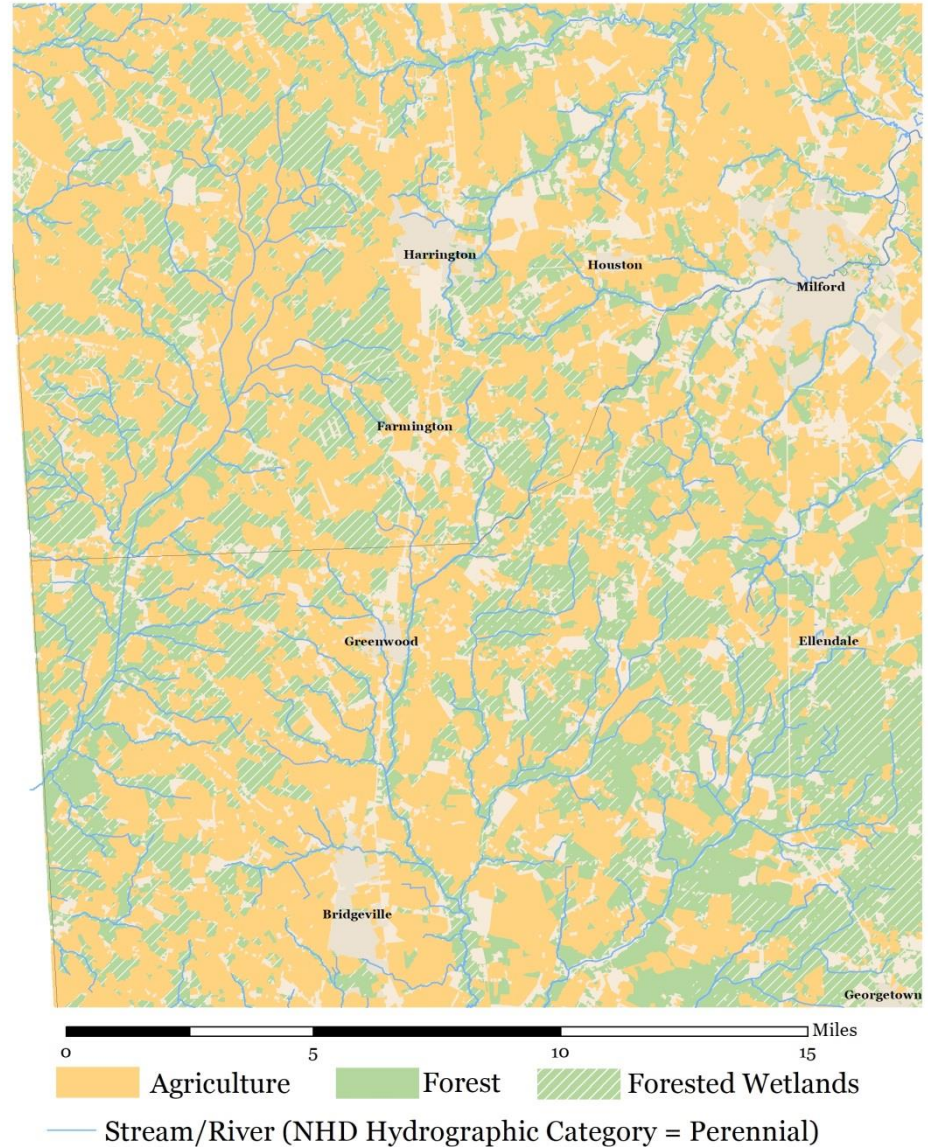
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## Natural stream network of selected segment

Segment of southern Kent and northern Sussex counties draining to Chesapeake Bay

Blue lines are natural hydrology crossing Ag and forest dominated landscape.

Urban is gray and towns are labeled.





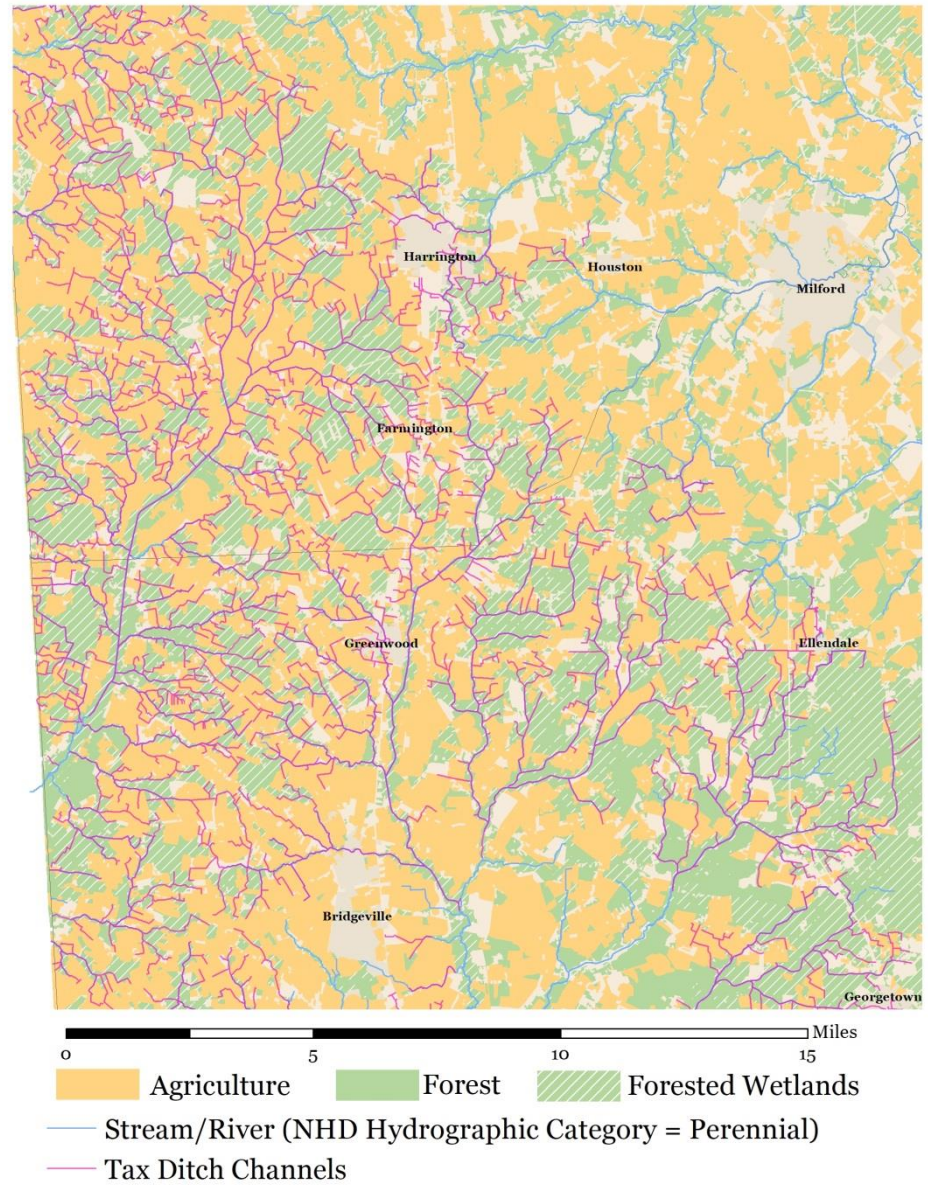
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## Tax ditch visualization

Tax ditch network from segment overlaid with landuse and hydrology.

Clearly the extent of the ditching extends the length of reach of the natural hydrology, especially into agricultural reaches where buffering potential in E3 scenario is high.

Note: digital mapping of ditches is incomplete where as the original E3 methodology for forest buffers was based on imagery and therefore more complete in extent.





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# Process with EPA assistance

## Changes since 4/5 Letter

- Estimation of buffers was changed from 3 to 4% to align logic
- NM component of estimate eliminated
- New E3 run by CBPO and DE in CAST supports new estimate
- Allocation methodology applied by CBPO

CAST run	Resulting TN estimate	Load scale
DE's 4/5 letter	980k	EOS
CBPO-DE E3 change	784k	EOS
“	292k	EOT
Allocation applied	187k	EOT
5/15 Special Case Request - DE	187k	EOT



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# Considerations

- An associated difference in P Planning Target following the methodology is: 840 lbs.
- An allocation adjustment would potentially affect all jurisdictions.
- Options for sourcing the lbs in the allocation could include:
  - Allocation Redistribution; other state goals would change
    - Could be equitable amongst all states or
    - Targeted with mutual agreement from other state(s)
  - Redistribution to alternate WIPS; Conowingo WIP would bear the E3 change estimate
    - Not a favorable option for DE given the exception taken by leadership to contribute to Conowingo load issue





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# Considerations

- Allocation Redistribution; other state goals would change

**Change in Nitrogen Planning Targets - Redistribute Among Jurisdictions ("hockey sticks")**

Jurisdiction	Planning Target (M lbs)	Planning Target with DE ForestBuffer Change (M lbs)	Planning Target Difference w/ DE Buffer Change (M lbs)	Planning Target Difference w/ DE Buffer Change (%)
DC	2.425	2.425	-0.001	0.0%
<b>DE</b>	<b>4.587</b>	<b>4.775</b>	<b>0.187</b>	<b>4.1%</b>
MD	45.296	45.257	-0.038	-0.1%
NY	11.594	11.588	-0.005	0.0%
PA	73.181	73.120	-0.061	-0.1%
VA	55.822	55.792	-0.031	-0.1%
WV	8.237	8.234	-0.003	0.0%
<b>Total</b>	<b>201.143</b>	<b>201.191</b>	<b>0.048</b>	<b>0.0%</b>

**Change in Phosphorus Planning Targets - Redistribute Among Jurisdictions ("hockey sticks")**

Jurisdiction	Planning Target (M lbs)	Planning Target with DE ForestBuffer Change (M lbs)	Planning Target Difference w/ DE Buffer Change (M lbs)	Planning Target Difference w/ DE Buffer Change (%)
DC	0.130	0.129	-0.001	-0.5%
<b>DE</b>	<b>0.120</b>	<b>0.120</b>	<b>0.001</b>	<b>0.7%</b>
MD	3.604	3.602	-0.001	0.0%
NY	0.606	0.606	0.000	0.0%
PA	3.073	3.075	0.002	0.0%
VA	6.186	6.185	-0.001	0.0%
WV	0.456	0.456	0.000	0.0%
<b>Total</b>	<b>14.173</b>	<b>14.173</b>	<b>0.000</b>	<b>0.0%</b>



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# Considerations

- Redistribution to alternate WIPS; Conowingo WIP would bear the E3 change estimate

<b>Change in Nitrogen Planning Targets - All to Conowingo</b>					
	Planning Target	Planning Target with DE	Planning Target	Planning Target	
	ForestBuffer Change	Difference w/ DE Buffer Change	Difference w/ DE Buffer Change	Difference w/ DE Buffer Change	
Jurisdiction	(M lbs)	(M lbs)	(M lbs)	(%)	
DC	2.425	2.425	0.000	0.0%	
<b>DE</b>	<b>4.587</b>	<b>4.701</b>	<b>0.114</b>	<b>2.5%</b>	
MD	45.296	45.296	0.000	0.0%	
NY	11.594	11.594	0.000	0.0%	
PA	73.181	73.181	0.000	0.0%	
VA	55.822	55.822	0.000	0.0%	
WV	8.237	8.237	0.000	0.0%	
<b>Total</b>	<b>201.143</b>	<b>201.257</b>	<b>0.114</b>	<b>0.1%</b>	
<b>Change in Phosphorus Planning Targets - All to Conowingo</b>					
	Planning Target	Planning Target with DE	Planning Target	Planning Target	
	ForestBuffer Change	Difference w/ DE Buffer Change	Difference w/ DE Buffer Change	Difference w/ DE Buffer Change	
Jurisdiction	(M lbs)	(M lbs)	(M lbs)	(%)	
DC	0.130	0.130	0.000	0.0%	
<b>DE</b>	<b>0.1196</b>	<b>0.1201</b>	<b>0.0005</b>	<b>0.4%</b>	
MD	3.604	3.604	0.000	0.0%	
NY	0.606	0.606	0.000	0.0%	
PA	3.073	3.073	0.000	0.0%	
VA	6.186	6.186	0.000	0.0%	
WV	0.456	0.456	0.000	0.0%	
<b>Total</b>	<b>14.173</b>	<b>14.174</b>	<b>0.001</b>	<b>0.0%</b>	