Chesapeake Bay Program Office
Most Effective Basins Funding Allocation

In the U.S. Environmental Protection Agency's (EPA) Fiscal Year (FY) 2022 Appropriations Conference Report, $7.25 million was targeted to the Chesapeake Bay Program (CBP) Budget for "state-based implementation in the most effective basins." This document describes the methodology EPA followed to establish the most effective use of these funds and the best locations for these practices to be implemented to make the greatest progress toward achieving water quality standards in the Chesapeake Bay. **EPA will use the same methodology and funding allocation that was used in FY 2021 for the $6 million allocation targeting agriculture and for the remaining $1.25 million supporting projects in underrepresented communities.**

Funding Priority 1: Agriculture

The most effective basins to reduce the effects of excess nutrient loading to the Bay were determined considering two factors: cost effectiveness and load effectiveness. Cost effectiveness was considered as a factor to assure these additional funds result in state-based implementation of practices that achieve the greatest benefit to water quality overall. It was evaluated by looking at what the jurisdictions have reported in their Phase III Watershed Implementation Plans (WIPs) as the focus of their upcoming efforts, and by looking at the average cost per pound of reduction for best management practice (BMP) implementation by sector.

Past analyses of cost per pound of reduction have shown that reducing nitrogen is less costly by far than reducing phosphorus.[1] Based on that fact, EPA determined that the focus of this evaluation would be to target nitrogen reductions in the watershed. Evaluating the load reduction targets in all the jurisdictions' Phase III WIPs shows that the agricultural sector is targeted for 86 percent of the overall reductions identified to meet the 2025 targets collectively set by the jurisdictions. This means that most of the BMPs to be implemented in the watershed in the coming years are focused on the agricultural sector.

On average, BMPs placed in the agricultural sector have been identified as the most cost effective BMPs. Data collected on BMP cost efficiency show the average cost per pound of nitrogen reduction for agricultural BMPs is approximately $24. This is much more cost-effective than the practices of stream restoration, shoreline erosion and sedimentation control that have been shown to cost about $354 per pound. Comparatively, the average cost of urban BMPs is roughly $2,259 per pound of nitrogen reduction, nearly 100 times that for agriculture. Based on this information, agricultural BMPs for reduction of nitrogen are the most cost effective to implement.

Load effectiveness is a measure of the ability of management practices implemented in a given

[1] The information, largely collected over a 15-year period by the Chesapeake Bay Program Office for use in the Partnership's Watershed Models, includes 1) the cost per unit of Best Management Practices (BMP), for over 200 BMPs, from contracted economists, and 2) the effectiveness of each BMP (the pounds of nutrients and sediment reduced per unit of BMP), mostly from "Expert Panels" made up of academics, agronomists, and practitioners working in the source sectors, including agriculture. The estimates of nutrient loads reduced to the Chesapeake Bay are from the 6th-generation Chesapeake Bay Program Watershed Model [Chesapeake Bay Program, 2017. Chesapeake Assessment and Scenario Tool (CAST) Version 2017d. Chesapeake Bay Program Office, last accessed April 2020].

area (basin) to have a positive effect on dissolved oxygen in the Bay.[2] Load effectiveness is the combination of three factors: land to water, delivery, and dissolved oxygen response. Each of these factors is described below.

The land to water factor represents how nitrogen applied to the land moves through the soil and is transported to the water. It is a measure of the natural propensity of the landscape to deliver nitrogen to waterways. In the phase 6 model, this factor considers groundwater recharge rates, average available water capacity, and the fraction of land in the piedmont carbonate hydrogeomorphological region by basin to determine the average nitrogen load expected to reach the local streams and rivers. An area with a land-to-water factor of 1 will deliver twice as much nitrogen as an area with a land-to-water factor of 0.5, all else being equal. The land to water factor does not consider land management, which is a separate analysis of available reductions.

The delivery factor is an estimate of the fraction of load reaching a stream, in a given basin, that will eventually make it to tidal waters. In the phase 6 model, it is calculated as a combination of stream and river factors. Stream factors generally apply to streams and reservoirs included in the National Hydrography Dataset that have an average annual flow less than 100 cubic feet per second and are calculated empirically using the USGS's SPARROW (SPAtially Referenced Regression On Watershed attributes) model. River factors apply to rivers and reservoirs with an annual flow greater than 100 cubic feet per second and are simulated by the CBP's Phase 6 dynamic model using HSPF (Hydrologic Simulation Program - Fortran).

The final factor is a measure of the Bay's dissolved oxygen response to nutrient loads from different areas of the watershed. It is based on estuarine circulation patterns and biogeochemical transformations. In the 2017 estuarine Water Quality and Sediment Transport Model (this is the official title of the model used to evaluate dissolved oxygen response to nutrient input throughout the Bay), the oxygen response factor is calculated as the impact of a unit nitrogen load reduction on the critical segments or segments of the Bay. The critical segments were defined in the 2010 Chesapeake Bay Total Maximum Daily Load (Bay TMDL) as the set of segments where, if dissolved oxygen criteria are met, the remaining segments of the Bay will all meet their dissolved oxygen goals. These critical segments are the estuarine monitoring segments CB3MH, CB4MH, CB5MH, and POTMH for deep water and CB3MH, CB4MH, and CB5MH for deep channel. Each area of the watershed (basins) has a different effect on these critical segments. As an example, the Susquehanna River, located at the northern end of the Bay, has a greater effect on the dissolved oxygen in the deep water/deep channel area of the Bay than the James River, which is in the lower portion of the Bay. Nitrogen from the Susquehanna has a relatively long residence time in the Bay and must pass through the critical monitoring segments, while much of the nitrogen from the James passes out to the ocean through the Bay mouth.

In order to evaluate the load effectiveness for a given basin, the phase 6 modeling suite was used to simulate the effect of nitrogen loading from agricultural lands in each identified basin. This evaluation included both the watershed model and the estuarine model. Through this evaluation a value of load effectiveness was assigned to each basin. This information was then used to

[2] Load effectiveness is the same measure known as relative effectiveness used to calculate allocations as described in Section 6.3 of the 2010 Bay TMDL. It was also used to calculate Phase WIP III nitrogen planning targets in 2017.

determine which basins are the most effective at reducing the impact of nitrogen to the critical Bay segments identified in the previous paragraph.

Funding Allocation Methodology

EPA will provide the most effective basins funding for nitrogen reduction from the most cost-effective BMPs in the agricultural sector to the Chesapeake Bay watershed jurisdictions that have committed to reducing the agricultural contribution of nitrogen in their Phase III WIPs, i.e. Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia. The District of Columbia does not have an agricultural commitment through 2025. Using the state Phase III WIPs, EPA identified each state's nitrogen reduction commitment between now and 2025. The total load of these obligations to reduce nitrogen from Agriculture was added and then a percentage for each of those jurisdictions was determined. The $6 million Most Effective Basins (MEB) money will be allocated using the individual percentages for those jurisdictions to complete implementation work in the most effective basins identified within their boundaries. Table 1 shows, by jurisdiction, the percentage of agricultural sector implementation proposed in each WIP and the resulting MEB funding allocation.

Table 1: MEB Funding Allocation by Jurisdiction

Jurisdiction	Phase III WIP Ag Nitrogen Commitment (million pounds)	Percent of Total Nitrogen Commitment Proposed	MEB Funding Allocations ($)
DC	0.0	0.00%	-
DE	2.2	6.08%	$ 364,540
MD	4.2	11.60%	$ 695,940
NY	0.5	1.33%	$ 79,536
PA	22.3	61.59%	$ 3,695,112
VA	6.7	18.50%	$ 1,110,191
WV	0.3	0.91%	$ 54,681
Totals	36.2	100.00%	$ 6,000,000

Determining the best locations for use of the additional funding for MEB comes from the rigorous evaluation that has been explained above. The charge given by Congress was to spend this money in the most effective basins. The questions to be answered are, what size basins provide the best and most targeted use of these funds to get the maximum load reduction possible? Where are the most effective basins located?

Basins can be delineated in many shapes and sizes. For this evaluation, three different shape/size combinations were evaluated: Minor Basins, Hydrologic Unit Code[3] (HUC) size 8 (HUC8), and River Segments. Two additional hybrid options, one from the Minor Basins, and one from the

[3] Hydrologic Unit Code: The United States is divided and sub-divided into successively smaller hydrologic units. These hydrologic units are also known as watersheds. Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to twelve digits. The two-digit HUCs represent very large watersheds and each additional set of digits added decreases the size of the watershed. This division of watersheds is created using the National Hydrography Dataset (NHD). The NHD represents the nation's drainage networks and related features, including rivers, streams, canals, lakes, ponds, glaciers, coastlines, dams, and stream gages.

River Segments were created to place jurisdictional boundary lines over top of the Minor Basins and River Segments.

There are 25 Minor Basins in the watershed, typically ranging in size from 680 square miles to 3,280 square miles. The basin sizes resulting from this method of segmentation vary greatly. An example of a Minor Basin is the Lower Potomac which covers approximately 2,580 square miles. These are very large tracts of land and may represent extremely varied land uses.

At the HUC 8 scale, there are 53 basins that typically range in size from 810 square miles to 1,580 square miles. The basins are much more homogenous in size compared to the Minor Basin scale mentioned above. Although this segmentation is more homogenous, it still represents extremely varied land use within a basin.

The third option is to divide the watershed by River Segments. The Phase 6 CBP Watershed Model divides the Chesapeake Bay watershed into 979 land-river segments, typically ranging from 10 to 100 square miles. These land-river segments were provided with attributes, including the name of the river. Segments with the same river name were combined to form 311 named rivers with a typical range of 70 to 250 square miles. Most named rivers are nested within river basins of different sizes. For example, Bobs Creek (170 square miles) is also part of the Juniata River (3,400 square miles) and Susquehanna River (27,500 square miles) but for this analysis carries the name attribute for Bobs Creek only. Segments designated as 'Juniata' are just the 770 square miles of river basin that are not part of any smaller system. This provides a much finer resolution scale and will have less varied land use in a basin.

Finally, there are two different options to account for jurisdiction boundaries. These hybrid options were developed to overlay those boundaries over the Minor Basins and River Segments identified above. The 26 Minor Basins, divided further by jurisdictional boundaries, result in 43 State Minor Basin Segments, with a typical size of 270 square miles to 1600 square miles. Using the example of the Lower Potomac, there are now four divisions of this minor basin when segmenting by jurisdiction. These are the DC Lower Potomac – 60 square miles, MD Lower Potomac – 1040 square miles, and VA Lower Potomac – 1480 square miles. The 311 named River Segments, divided further by jurisdictional boundaries, result in 383 State-River Segments, with a typical size-range of 50 to 200 square miles. Each State-River Segment may be comprised of several land-river segments. This further division of the State River Basins is the same as described with the State Minor Basins.

Based on our analysis, EPA has determined that the most appropriate scale or segmentation to be used in this allocation is the hybrid State-River segment scale. All the segmentation options were evaluated. The smaller scale provided much more focus than the larger scale segmentation which dampened the effectiveness of the smaller areas. This scale provides focus for the funds to be used in the most effective areas of the watershed. Each basin identified as being the most effective in each jurisdiction (except DC) has agricultural loading available to be reduced. This scale provides direction to the jurisdictions on where to target the funds they receive to reflect the intent of Congress most accurately in allocating this funding.

The effect of nitrogen to the critical Bay segments as a ratio of pounds delivered to dissolved oxygen response for each of the 383 river segment basins identified can be found in the Most Effective Basins Funding Allocations Rationale (updated May 2021). The basins are shown in order of load effectiveness. The table also shows the amount of nitrogen reduced in that basin to date based on reporting by jurisdictions, remaining nitrogen load to be reduced in those basins (from modeling runs), and the size of the basin. At an average cost of $24 per pound of reduction of nitrogen, $6 million for implementation of BMPs in the MEBs should result in approximately 250,000 pounds of nitrogen reduction overall.

Table 2 below shows the most effective basins in which implementation using these funds is to occur.

Table 2: Most Effective Basins Ranked by Total Nitrogen (TN) Reduction Effectiveness

Rank	Jurisdiction	State Rivers	TN Effectiveness
1	PA	York Indian Rock Dam	23.68
2	PA	Black Creek	18.97
3	PA	Safe Harbor Dam	18.83
4	PA	Codorus Creek	18.27
5	PA	Little Swatara Creek	17.67
6	PA	Chiques Creek	17.08
7	PA	Conestoga Creek	16.74
8	PA	Pequea Creek	16.09
9	PA	Deer Creek	15.55
10	PA	Catawissa Creek	15.42
11	PA	Mill Creek	15.30
12	PA	Shamokin Creek	15.26
13	PA	Codorus Creek West Branch	15.16
14	PA	Mahanoy Creek	15.12
15	PA	Nescopeck Creek	15.04
16	MD	Jones Falls	14.95
17	PA	Swatara Creek	14.89
18	PA	Roaring Creek	14.88
19	PA	Mahantango Creek	14.74
20	MD	Little Pipe Creek	14.74
21	PA	Octoraro Creek	14.72
22	WV	Stony River	14.51
23	MD	Deer Creek	14.46
24	PA	Alvin R. Bush Dam	14.28
25	PA	Sinnemahoning Creek	14.18
26	PA	Middle Creek	14.12
27	PA	Cocalico Creek	14.04
28	PA	East Licking Creek	13.96
29	PA	Buffalo Creek	13.95
30	PA	Tuscarora Creek	13.93
31	WV	Mt. Storm Power Station Dam/StoRiver Dam	13.92

32	PA	Larrys Creek	13.91
33	PA	Wiconisco Creek	13.87
34	MD	Bloomington/Jennings Randolph	13.67
35	PA	Codorus Creek South Branch	13.63
36	PA	Wills Creek	13.31
37	PA	Fishing Creek	13.31
38	PA	Juniata River	13.28
39	MD	Tonoloway Creek	13.17
42	VA	Lower Eastern Shore Tidal Drainage	12.94
60	WV	Potomac River North Branch	12.09
67	VA	Pocomoke River	11.73
83	DE	Lower Eastern Shore Tidal Drainage	10.90
86	NY	Owego Creek	10.71
88	DE	Nanticoke River	10.66
103	VA	Great Wicomico River	10.11
118	DE	Middle Eastern Shore Tidal Drainage	9.59
121	NY	Tioughnioga Creek	9.44
125	NY	Tioughnioga River West Branch	9.26

Funding Priority 2: Underrepresented Communities

In FY 2021, an additional $1.25 million was appropriated for “state-based implementation in the most effective basins.” EPA and the Chesapeake Bay Partnership have renewed their commitment and focus on inclusion and equity with regard to historically underrepresented communities, including communities of color and communities of lower socioeconomic status. EPA is focusing this additional funding allocation on those areas that have been identified as being most effective for improving water quality while targeting underrepresented communities. The allocation for this funding will follow the same funding allocation used for the Chesapeake Bay Implementation Grants (CBIG). The CBIG allocation formula awards funds to the seven jurisdictional partners in the following manner: a 20% share goes to MD, PA, and VA, a 10% share goes to DC, DE, NY, and WV. The following table shows the breakdown for this $1.25 million appropriation.

Table 3: MEB Funding Allocation by Jurisdiction (Remaining $1.25 Million)

Jurisdiction	CBIG Percentage Split	MEB Funding Allocation ($)
DC	10%	$ 125,000
DE	10%	$ 125,000
MD	20%	$ 250,000
NY	10%	$ 125,000
PA	20%	$ 250,000
VA	20%	$ 250,000

Jurisdiction	CBIG Percentage Split	MEB Funding Allocation ($)
WV	10%	$ 125,000
Totals	100%	$ 1,250,000

The selection of MEBs for this funding allocation of 1.25 million dollars will look at two factors: underrepresented communities and load effectiveness. Underrepresented communities will be identified based on demographic metrics from the American Community Survey which are available on the EPA Environmental Justice Screening and Mapping Tool. Low income is defined as ratio of income to cost of living that is less than two. Data is presented as a census block group with a percentage of population that is low income >=50%. Communities of color are defined as all other ethnicities other than Caucasian. Data is presented as a census block group with a percentage of people of color population >= 37%. 37% is chosen to mirror the national percentage of people of color. These definitions come from work completed by the CBP Diversity Workgroup where they provided "best professional judgement" in terms of interpreting two of the metrics (communities of color and low income) to help rank areas for composite conservation and restoration benefits.

Load Effectiveness for this analysis was completed in the exact same manner as it was described on page 3 of this document with one exception. These MEBs are the result of evaluating the effect of all nonpoint source loads of nitrogen instead of just loads of nitrogen from agriculture. Additionally, the scale used to determine these MEBs is the State-River basin segmentation that was described in the earlier analysis. Table 4 shows the list of Most effective basins that overlay the areas that have been identified as underrepresented communities. **The most effective basins for focusing this funding are shown in gray highlight. This list has been expanded compared to the FY 2021 list of eligible basins to allow jurisdictions more flexibility in reaching underrepresented communities in their respective jurisdictions.**

Table 4: Most Effective Basins that Overlay Areas Identified as Underrepresented Communities (As Represented by Gray Highlighted)

Rank	Jurisdiction	State-Rivers	TN Effectiveness	TN Reductions Made to Date	TN Load Remaining to Reduce	Watershed Size (sq. mi.)
1	PA	York Indian Rock Dam	22.87	14237	218825	21
1	PA	Black Creek	19.39	27953	63440	62
3	PA	Codorus Creek	19.11	9916	367864	66
4	PA	Safe Harbor Dam	17.51	107726	799160	114
5	PA	Chiques Creek	17.16	551740	1857828	126
6	PA	Conestoga Creek	16.68	953008	3007086	278
7	PA	Little Swatara Creek	16.34	0	1110781	99
8	PA	Pequea Creek	16.12	403680	1865801	155
9	PA	Shamokin Creek	16.08	12615	332191	137
10	PA	Mahanoy Creek	15.96	17014	382719	157
11	PA	Mill Creek	15.58	220956	668640	56
12	PA	Octoraro Creek	15.11	259512	1974658	176

13	PA	Deer Creek	15.06	25340	218681	25
14	PA	Catawissa Creek	14.86	21243	301544	153
15	WV	Stony River	14.59	2004	10285	10
16	PA	Codorus Creek West Branch	14.58	31409	308201	50
17	MD	Little Pipe Creek	14.42	304558	517846	83
18	PA	Swatara Creek	14.32	219465	1600423	396
19	MD	Deer Creek	14.11	201343	626682	146
20	PA	Cocalico Creek	14.1	303655	1094543	140
21	PA	Mahantango Creek	14.08	124321	793410	165
22	PA	Roaring Creek	13.84	27979	330495	88
23	PA	Nescopeck Creek	13.83	94098	167141	112
24	PA	Wiconisco Creek	13.8	181818	368808	116
25	MD	Bloomington/Jennings Randolph	13.64	10882	41235	63
26	PA	Middle Creek	13.64	0	817242	177
27	WV	Mt. Storm Power Station Dam/Stony River Dam	13.53	9634	58170	49
28	MD	Susquehanna River	13.37	9581	65361	28
29	PA	East Licking Creek	13.37	10549	76561	46
30	VA	Lower Eastern Shore Tidal Drainage	13.26	145008	1224541	219
31	MD	Savage River Dam	13.25	13567	30384	56
32	PA	Tuscarora Creek	13.08	38911	590526	224
33	PA	Sherman Creek	12.93	0	778438	276
34	MD	Octoraro Creek	12.84	51357	123333	35
35	PA	Codorus Creek South Branch	12.81	45232	703913	117
36	PA	Buffalo Creek	12.79	28828	859729	207
37	PA	Alvin R. Bush Dam	12.78	1196	18824	95
38	PA	Juniata River	12.71	207199	1992742	767
39	PA	Larrys Creek	12.69	32513	83963	89
40	PA	Susquehanna River	12.62	1360081	4779581	2262
41	PA	Penns Creek	12.59	107376	1115206	377
42	PA	Fishing Creek	12.5	96073	653637	271
43	MD	Potomac River North Branch	12.36	62959	136977	157
44	MD	Conowingo Dam	12.24	13275	42727	23
45	WV	Bloomington/Jennings Randolph	12.21	1663	70956	81
46	MD	Muddy Creek	12.08	1003	4615	2
47	WV	Potomac River North Branch	12.06	18036	160819	162
48	MD	Monocacy River	11.99	1008035	1657042	448
49	PA	Sinnemahoning Creek	11.99	5284	11534	72

50	MD	Lingamore Creek	11.88	212204	380907	89
51	PA	Chillisquaque Creek	11.87	77137	545406	112
52	PA	Warrior Ridge Dam	11.87	15990	129815	78
53	PA	Susquehanna River West Branch	11.78	348229	2137577	1745
54	PA	Holtwood Dam	11.73	9014	242256	50
55	PA	Bald Eagle Creek	11.71	151794	600282	383
56	PA	Aughwick Creek	11.7	9009	94102	47
57	VA	Pocomoke River	11.67	5584	108298	24
58	MD	Jones Falls	11.66	5654	170604	58
59	PA	Muddy Creek	11.66	50272	855327	137
60	MD	Lower Western Shore Tidal Drainage	11.64	27704	714109	275
61	MD	Savage River	11.64	17958	42274	60
62	PA	White Deer Creek	11.52	0	20073	45
63	PA	Broad Creek	11.51	99	2602	1
64	MD	Big Pipe Creek	11.48	281098	507253	109
65	PA	Cush Creek	11.46	94404	608556	191
66	MD	Middle Western Shore Tidal Drainage	11.42	7177	332988	118
67	PA	Foster Joseph Sayers Dam	11.42	26444	120565	73
68	MD	Broad Creek	11.34	62779	140252	40
69	PA	Beech Creek	11.32	6483	72132	171
70	PA	George B. Stevenson Dam	11.25	1764	2925	27
71	PA	Little Juniatta River	11.1	68670	728326	343
72	DE	Nanticoke River	11	112513	1009792	91
73	PA	Blacklog Creek	10.98	6420	77292	73
74	DE	Lower Eastern Shore Tidal Drainage	10.96	100031	2012862	232
75	PA	Conowingo Dam	10.9	109679	850259	102
76	MD	Wills Creek	10.88	14380	44297	61
77	PA	Conogoguinet Creek	10.84	0	2397677	458
78	PA	Huntington Creek	10.82	72545	114179	114
79	PA	Big Elk Creek	10.73	88005	349503	42
80	PA	Wills Creek	10.73	39775	283946	193
81	PA	Bennette Branch	10.54	24401	96810	377
82	PA	Quittapahilla Creek	10.39	23640	643461	77
83	PA	Conococheague Creek West Branch	10.37	0	1212735	198
84	PA	Texas Creek	10.36	45659	117707	180
85	PA	Muncy Creek	10.32	119615	318205	204
86	VA	Great Wicomico River	10.26	59620	370341	128
87	PA	Meshoppen Creek	10.15	126494	132856	115
88	PA	Yellow Breeches Creek	10.05	0	744883	220

89	WV	Back Creek	10	0	109425	106
90	MD	Little Conococheague Creek	9.97	24013	57469	17
91	PA	Kettle Creek	9.97	3104	56482	152
92	PA	Moshannon Creek	9.95	16234	149836	274
93	PA	Driftwood Branch	9.94	34099	14962	95
94	MD	Tonoloway Creek	9.9	623	3070	2
95	MD	Licking Creek	9.87	7539	29706	27
96	PA	Conococheague Creek	9.84	891	1981838	304
97	PA	Juniata River Frankstown Branch	9.81	1887	935455	396
98	NY	Owego Creek	9.72	14266	21236	13
99	MD	Nanticoke River	9.71	53543	120930	20
100	MD	Winters Run	9.7	18598	186226	58
101	PA	Bowman Creek	9.7	50820	60678	120
102	MD	Conococheague Creek	9.63	102907	282130	66
103	WV	Sleepy Creek	9.63	16944	86747	125
104	DE	Middle Eastern Shore Tidal Drainage	9.61	15869	124020	19
105	PA	Lycoming Creek	9.61	42472	199800	273
106	MD	Potomac River	9.6	320501	799081	373
107	MD	Big Elk Creek	9.56	4727	24146	11
108	PA	Branch Creek	9.56	0	214490	46
109	PA	Wallis Run	9.55	5586	19906	37
110	PA	Cayuta Creek	9.53	2067	5048	2
111	MD	Great Seneca Creek	9.35	122870	214447	102
112	PA	Sinnemahoning Creek First Fork	9.33	7362	77126	240
113	MD	Antietam Creek East Branch	9.32	9267	22410	8
114	PA	Potomac River	9.3	1140	12444	3
115	PA	Wyalusing Creek	9.3	222476	245752	220
116	MD	Upper Western Shore Tidal Drainage	9.29	42521	264224	141
117	PA	Pine Creek	9.24	57915	219806	599
118	PA	Sideling Hill Creek	9.23	19918	384431	284
119	MD	Middle Eastern Shore Tidal Drainage	9.2	638248	1771391	348
120	PA	Licking Creek	9.19	27154	407836	186
121	PA	Conewago Creek	9.11	282392	1775750	510
122	PA	Lackawanna River	9.07	33808	206810	348
123	DC	Bull Run	8.93	0	4086	20
124	MD	Gunpowder Falls	8.92	84899	376374	175
125	PA	Little Northeast Creek	8.9	2852	66473	8
126	PA	Loyalsock Creek	8.9	43639	204007	377

127	MD	Georges Creek	8.75	14601	37387	75
128	MD	Choptank River	8.73	139913	551765	108
129	MD	Lower Patuxent Tidal Drainage	8.65	75751	562738	300
130	WV	Cacapon River	8.63	3814	22942	61
131	MD	Antietam Creek	8.58	262951	641720	178
132	MD	Marshyhope Creek	8.52	221074	589651	119
133	VA	Sleepy Creek	8.52	0	15459	20
134	MD	Loch Raven Dam	8.43	3790	45168	31
135	VA	South Branch Potomac	8.39	0	69628	59
136	MD	Seneca Creek	8.38	38860	75753	27
137	PA	Mehoopany Creek	8.38	28506	41128	123
138	DE	Deep Creek	8.37	3913	233516	30
139	WV	Potomac River	8.37	53672	433956	320
140	MD	Western Run	8.32	83020	295407	118
141	PA	Little Conococheague Creek	8.32	0	517	1
142	PA	Spring Creek	8.29	94318	363288	146
143	WV	Potomac River South Branch	8.26	107838	573565	543
144	MD	Evitts Creek	8.2	5098	20560	31
145	NY	Nanticoke Creek	8.2	78095	106981	114
146	MD	Little Northeast Creek	8.19	59312	161058	48
147	PA	Curwensville Dam	8.18	11604	27207	53
148	MD	Hunting Creek	8.16	203	44248	26
149	NY	Tioughnioga River West Branch	8.15	192589	180026	104
150	WV	Opequon Creek	8.13	31496	403725	192
151	VA	Potomac River South Branch North Fork	8.11	577	7336	38
152	DC	Potomac River	8.09	401	30511	14
153	MD	Marsh Run	8.06	26001	78497	21
154	MD	Lower Potomac Tidal Drainage	8.05	60460	716945	428
155	PA	Antietam Creek East Branch	7.97	0	429574	86
156	NY	Tioughnioga River	7.95	243695	220389	208
157	MD	Middle Patuxent River	7.92	89327	148208	58
158	WV	North River	7.89	13878	198766	206
159	NY	Tioughnioga Creek	7.88	227968	239600	193
160	VA	Lower Potomac Tidal Drainage	7.87	83589	563421	470
161	MD	Marsh Creek	7.83	22088	40985	11
162	MD	Nassawango Creek	7.82	129103	130002	68
163	WV	Reeds Creek	7.73	1563	18853	65

164	NY	Susquehanna River	7.72	682455	751626	890
165	DC	Anacostia River	7.71	1380	37452	18
166	MD	Lower Eastern Shore Tidal Drainage	7.67	805230	1713780	454
167	PA	Tonoloway Creek	7.67	13483	261108	112
168	MD	North East Branch Anacostia River	7.61	7435	103822	75
169	WV	Potomac River South Branch North Fork	7.5	16538	113755	212
170	MD	Chester River	7.49	70737	161788	35
171	PA	Chest Creek	7.45	42823	152933	129
172	MD	Patuxent River	7.43	70154	259029	176
173	PA	Fifteen Mile Creek	7.43	788	8244	12
174	MD	Tuckahoe River	7.42	222241	657718	150
175	NY	Owego Creek East Branch	7.4	88049	97821	101
176	NY	Chenango River	7.37	621464	577651	614
177	NY	Catatonk Creek	7.36	105054	135579	151
178	MD	Patapsco River	7.35	96286	355979	204
179	PA	Antietam Creek	7.33	0	155266	20
180	PA	Monocacy River	7.29	10592	116224	67
181	PA	Little Tonoloway Creek	7.28	0	12888	10
182	MD	Pocomoke River	7.19	817630	915510	301
183	MD	Upper Eastern Shore Tidal Drainage	7.19	1181710	2867947	748
184	MD	Catoctin Creek	7.16	178014	314785	120
185	VA	Shenandoah River South Fork	7.14	38566	1299039	618
186	DC	Rock Creek	7.1	134	15957	10
187	DE	Upper Eastern Shore Tidal Drainage	7.09	51447	148987	36
188	PA	Little Loyalsock Creek	7.08	25054	85224	82
189	WV	Shenandoah River	7.08	12912	48460	103
190	MD	Fifteen Mile Creek	7.07	1606	15025	50
191	PA	Marsh Creek	7.06	86013	488599	161
192	WV	South Branch Potomac	7.06	43742	188358	208
193	PA	Sugar Creek	7.04	176783	262318	190
194	MD	Conococheague Creek West Branch	7	0	98	0
195	VA	Back Creek	6.98	751	155817	309
196	VA	Shenandoah River	6.98	12912	48460	249
197	MD	Little Tonoloway Creek	6.96	5857	18895	15
198	NY	Owego Creek West Branch	6.95	49514	64209	77