Chesapeake Bay Program
A Watershed Partnership

www.chesapeakebay.net

Backgrounder

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Setting Nutrient and Sediment Reduction Goals for the Chesapeake Bay Watershed

Since 1987, Chesapeake Bay Program partners have worked together to reduce the amount of nutrients flowing into the Bay and its rivers. High nutrient levels threaten the delicate balance of the Bay ecosystem by causing the rapid growth of unhealthy algae and prohibiting light from reaching underwater grasses critical to the health of the Bay's fish and shellfish.

On June 28, 2000, the Chesapeake Executive Council signed *Chesapeake 2000* – a new and far-reaching agreement that now guides Maryland, Pennsylvania, Virginia, the District of Columbia, the Chesapeake Bay Commission, and the U.S. Environmental Protection Agency in their combined efforts to restore and protect the Chesapeake Bay.

As part of that agreement, Bay Program partners agreed to work with the headwaters states of Delaware, New York and West Virginia to set new, aggressive nutrient and sediment reduction goals that will provide the water quality necessary for the Bay's plants and animals to thrive.

New Nutrient Reduction Goals for Nitrogen and Phosphorus

On March 21, 2003, regional Bay restoration leaders agreed to steep cuts in the amount of nutrients flowing into the Bay and its rivers. The new goals commit the six Bay watershed states and the District of Columbia to reduce nutrient pollution by more than twice as much as was accomplished since coordinated Bay restoration efforts began nearly twenty years ago.

The new nutrient reduction goals, or allocations, call for Bay watershed states to reduce the amount of nitrogen from the current 285 million pounds to no more than 175 million pounds per year, and phosphorus from 19.1 million pounds to no more than 12.8 million pounds per year. When coordinated nutrient reduction efforts began in 1985, 338 million pounds of nitrogen and 27.1 million pounds of phosphorus entered the Bay annually.

When achieved, the new allocations will reduce annual nitrogen loads by 110 million pounds and phosphorus by 6.3 million pounds from 2000 levels and will provide the water quality necessary for the Bay's plants and animals to thrive.

For the First Time - A Baywide Sediment Reduction Goal

On April 15, 2003, regional Bay restoration leaders for the first time agreed to reduce Baywide sediment loads to provide water clarity necessary for underwater grasses to thrive. Bay states and the District of Columbia agreed to reduce land-based sediment runoff entering the Bay and its rivers from the current 5.04 million tons per year to no more than 4.15 million tons per year.

Throughout the next year, Bay Program partners will supplement land-based sediment reduction goals by focusing on nearshore sediment problems – such as shoreline erosion and the resuspension of shallow water sediments – that directly impact underwater grasses. Shoreline-based sediment reduction goals will be developed as part of each state's local tributary strategy process and work to reduce problems in areas most critical to improving underwater grass beds.

To drive aggressive sediment reductions, Bay Program partners also agreed to increase the existing bay grass restoration goal from 114,000 to 185,000 acres baywide by 2010. Scientists believe increasing bay grass coverage beyond today's 85,000 acres will result in dramatic improvements throughout the entire Bay ecosystem.

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Using Computer Models to Determine Allocations

To determine optimal nutrient and sediment allocations, Bay watershed partners developed several simulations for analysis by the Chesapeake Bay Watershed and Water Quality models. Each simulation, or scenario, allows Bay scientists to predict changes within the Bay ecosystem due to proposed management actions taking place throughout the Bay's 64,000-square-mile watershed.

Information is entered into the Watershed Model, which details likely results of proposed management actions. These actions range from improving wastewater treatment technology to reducing fertilizer or manure application on agricultural lands to implementing sound land use programs to planting streamside forest buffers.

Next, these results are run through the Bay Water Quality Model, which makes more than a trillion calculations and provides Bay scientists with a visualization of future Bay and river water quality conditions resulting from each scenario. Throughout the development of the new Bay water quality criteria, more than 70 Water Quality Model runs were conducted, each taking more than a week to complete.

At the agreed to allocation, the model predicts that we will see a Bay similar to that in the 1950s. Proposed water quality standards will be met in 96% of the Bay at all times, and the remaining 4% would fall shy of fully meeting the proposed standards for only four months a year.

Allocating Nutrient Reduction Goals to Each State in the Bay's Nine Major Basins

Once scientists arrived at baywide reduction goals, restoration leaders developed several approaches to allocate pollution reduction responsibilities to each state in the watershed. While the primary focus of the new nutrient and sediment reduction goals is to provide the water quality necessary for the Bay's plants and animals to thrive, the equitable distribution of nutrient reduction responsibilities was important to Bay watershed partners as well.

The Bay watershed was first divided into nine major river basins. Each basin was then subdivided by state boundaries resulting in 20 distinct state-specific basins. For example, the entire Susquehanna River basin was broken down into three state-specific basins belonging to New York, Pennsylvania and Maryland.

Then the effectiveness of implementing nutrient pollution controls in each of these zones was compared, and the 20 zones were separated into three groups. The primary group was targeted for the highest reductions, as nutrient reductions in these areas would result in the greatest environmental benefit for the Bay.

Many important factors were part of the final allocations equation, including pollution prevention strategies already implemented by each state, proximity to sensitive areas of the Bay (such as recovering SAV beds and oyster reefs), the overall effectiveness of proposed reductions and each state's relative contribution to water quality impairments.

The following pages detail nutrient and sediment allocations developed through this cooperative process. Bay Program partners will use the new goals to develop and hone plans to encourage residents, farmers, local governments, wastewater treatment plant operators and community watershed organizations to reduce the amount of nutrients and sediments flowing into local waterways.

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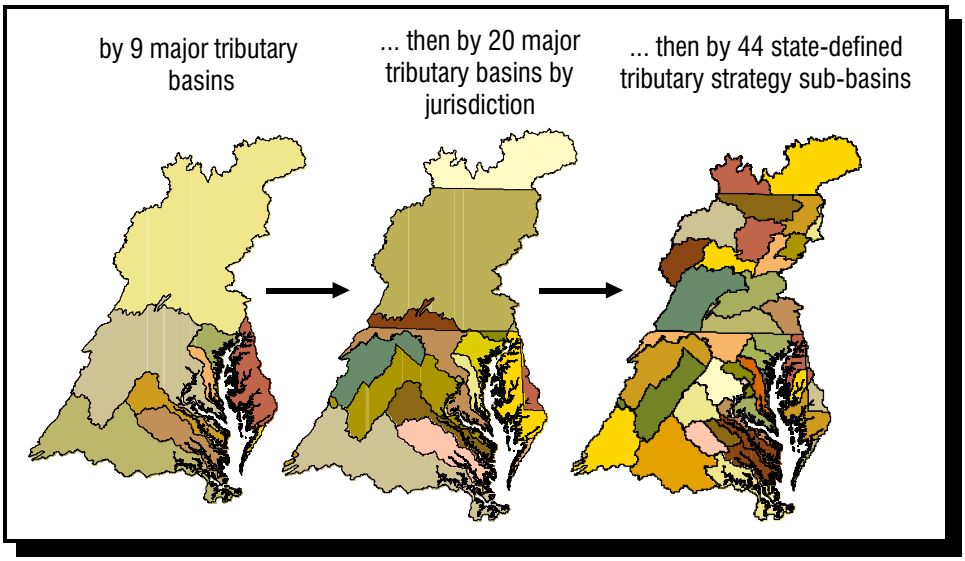

New nutrient and sediment goals were first allocated to the Bay watershed's nine major basins and then subdivided to state-specific zones within those basins.

This approach allows Bay Program partners to target pollution reduction efforts to have the greatest impact on the quality of local waters and the Bay.

Over the next year, these areas will be subdivided again into 44 state-defined tributary strategy basins that will allow the states to work with local residents to determine the best way to prevent pollution from reaching the Bay and its rivers.

Chesapeake Bay Watershed Nutrient and Sediment Reduction Goals by Basin

Basin/Jurisdiction	Nitrogen Allocation (million pounds/year)	Phosphorus Allocation (million pounds/year)	Land-based Sediment Allocation (million tons/year)
Susquehanna			
Pennsylvania	67.58	1.90	.793
New York	12.58	0.59	.131
Maryland	0.83	0.03	.037
Total	80.99	2.52	.962
Eastern Shore of Maryland			
Maryland	10.89	0.81	.116
Delaware	2.88	0.30	.042
Pennsylvania	0.27	0.03	.004
Virginia	0.06	0.01	.001
Total	14.10	1.14	.163
Western Shore of Maryland			
Maryland	11.27	0.84	.100
Pennsylvania	0.02	0.00	.001
Total	11.29	0.84	.100
Patuxent			
Maryland	2.46	0.21	.095
Potomac			
Virginia	12.84	1.40	.617
Maryland	11.81	1.04	.364
West Virginia	4.71	0.36	.311
Pennsylvania	4.02	0.33	.197
District of Columbia	2.40	0.34	.006
Total	35.78	3.48	1.494
Rappahannock			
Virginia	5.24	0.62	.288
York			
Virginia	5.70	0.48	.103
James			
Virginia	26.40	3.41	.925
West Virginia	0.03	0.01	.010
Total	26.43	3.42	.935
Eastern Shore of Virginia			
Virginia	1.16	0.08	.008
Basinwide Subtotal	183	12.8	4.15
Clear Skies Reduction	-8		
Basinwide Total	175	12.8	4.15

* Some figures may not add up due to rounding

Chesapeake Bay Watershed Nutrient and Sediment Reduction Goals by State

Jurisdiction/Basin	Nitrogen Allocation (million pounds/year)	Phosphorus Allocation (million pounds/year)	Land-based Sediment Allocation (million tons/year)
Delaware			
Eastern Shore of MD	2.88	0.30	.042
DE Total	2.88	0.30	.042
District of Columbia			
Potomac	2.40	0.34	.006
DC Total	2.40	0.34	.006
Maryland			
Susquehanna	0.83	0.03	.037
Patuxent	2.46	0.21	.095
Potomac	11.81	1.04	.364
Western Shore	11.27	0.84	.100
Eastern Shore of MD	10.89	0.81	.116
MD Total	37.25	2.92	.712
New York			
Susquehanna	12.58	0.59	.131
NY Total	12.58	0.59	.131
Pennsylvania			
Susquehanna	67.58	1.90	.793
Potomac	4.02	0.33	.197
Western Shore	0.02	0.00	.001
Eastern Shore of MD	0.27	0.03	.004
PA Total	71.90	2.26	.995
Virginia			
Potomac	12.84	1.40	.617
Rappahannock	5.24	0.62	.288
York	5.70	0.48	.103
James	26.40	3.41	.925
Eastern Shore of MD	0.06	0.01	.001
Eastern Shore of VA	1.16	0.08	.008
VA Total	51.40	6.00	1.941
West Virginia			
Potomac	4.71	0.36	.311
James	0.03	0.01	.010
WV Total	4.75	0.37	.320
Basinwide Subtotal	183	12.80	4.15
Clear Skies Reduction	-8		
Basinwide Total	175	12.80	4.15

* Some figures may not add up due to rounding

For additional information about restoring Chesapeake Bay water quality, visit www.chesapeakebay.net.