



**AN ANALYSIS OF
IMPERVIOUS AREA INCREASE VS. POPULATION
GROWTH
IN THE CHESAPEAKE BAY WATERSHED
BETWEEN 1990 AND 2000**

**FEBRUARY 23, 2010
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IN THE CHESAPEAKE BAY WATERSHED FROM 1990-2000

INTRODUCTION

Numerous presentations, websites¹, and documents have cited information from the EPA’s Chesapeake Bay Program describing a dramatic difference in the increase in impervious cover relative to population growth: “From 1990 to 2000, impervious surfaces increased by 41 percent – a rate five times greater than the 8 percent rate of population growth during that time.” This impervious area growth rate is being used as a justification for significant public policy changes in stormwater management policy. The purpose of this document is to examine the veracity of this statement, based upon publicly available information because it is important for the website to contain the most up-to-date, and correct, data.

EXECUTIVE SUMMARY

This analysis examines the statement made on the chesapeakebay.net website that population in the Chesapeake Bay watershed increased by 8% between 1990 and 2000 while impervious area increased by 41%². This claim appears to be erroneous based on U.S. Census data and the information provided in the Phase 5.2 Chesapeake Bay watershed model (a new model, Phase 5.3, is expected to be released soon – and could change the conclusions of this analysis). We also noted that this claim appears to be erroneous based on the previous (Phase 4.3) Chesapeake Bay watershed model data, although we did not analyze that data in-depth. The most current data available at the time of this writing indicates that population within the Chesapeake Bay watershed increased by approximately 10.3% while impervious area increased by 14.2%.

The following table summarizes our findings by state and shows several interesting trends that could be useful for public policy analysts and decision makers:

Jurisdiction (portion within the Chesapeake Bay watershed)	Population Increase (1990-2000) (%)	Impervious Area Increase (1990-2000) (%)
Chesapeake Bay Watershed	10.3%	14.2%
Delaware	23.2%	28.4%
District of Columbia	-5.7%	1.9%
Maryland	10.7%	15.2%
New York	-2.2%	3.7%
Pennsylvania	5.4%	10.6%
Virginia	16.8%	18.0%
West Virginia	18.0%	21.0%

¹ Specifically www.chesapeakebay.net, which disseminates information related to the Chesapeake Bay Community Watershed Model and the Bay Total Maximum Daily Load allowance.

² See http://www.chesapeakebay.net/status_population.aspx?menuitem=19842



It is critical for public policy makers to base decisions on the best available data; therefore, we have provided all of the data sources and our methodology in this paper so that these conclusions can be easily verified independently. We understand that errors can be made inadvertently, and we welcome any corrections to this analysis.

DISTRIBUTION OF THE IMPERVIOUS AREA INCREASE CLAIM

The graph of Chesapeake Bay Watershed Population and Impervious Surface (Figure 1, below) and the website text below the graph (Figure 2, below) indicate that population within the Chesapeake Bay watershed grew by 8% between 1990 and 2000, while impervious surfaces increased by 41% during the same time period. (See Appendix A for a complete screen shot of http://www.chesapeakebay.net/status_population.aspx?menuitem=19842.)

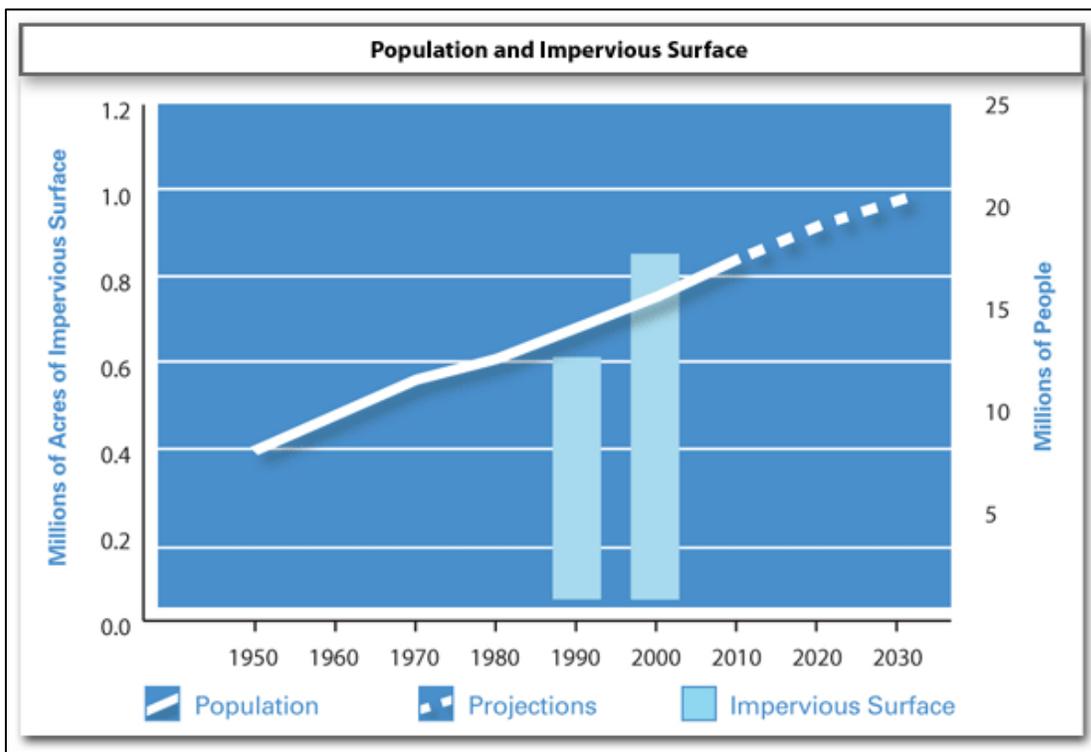


Figure 1. Bay Watershed Population and Impervious Surface.
(Source: http://www.chesapeakebay.net/status_population.aspx?menuitem=19842 Last accessed 2/20/2010)

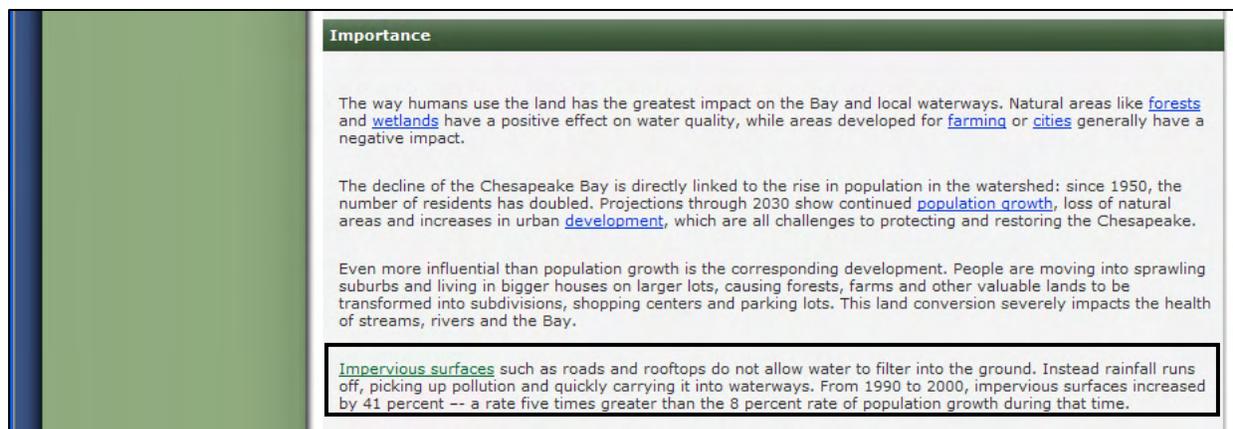


Figure 2. Text from http://www.chesapeakebay.net/status_population.aspx?menuitem=19842. Last accessed 2/20/2010

This claim has been cited in numerous articles, presentations, discussions, and legislation. A selection of these documents follows (also see Appendix A):

Senate Bill S.1816, *A Bill to Amend the Federal Water Pollution Control Act to Improve and Reauthorize the Chesapeake Bay Program*, submitted by Senator Cardin [D-MD], and H.R.3852, of the same name, submitted by Representative Cummings [D-MD]:

“(13) during the period beginning in 1990 and ending in 2000, impervious cover, the hardened surfaces through which water cannot penetrate, increased by nearly 250,000 acres, about 41 percent, or the size of 5³ Districts of Columbia;
 (14) during that period, the watershed population of the Chesapeake Bay grew by just 8 percent.”

Testimony of J. Charles Fox, Senior Advisor to Administrator Lisa P. Jackson, U.S. Environmental Protection Agency before the Subcommittee on Water Resources and Environment Committee on Transportation and Infrastructure, U.S. House of Representatives (9/22/2009):

“Impervious surfaces, such as roads and rooftops, increased by 41% compared to an 8% increase in population from 1990-2000.”

National Resources Conservation Service Memorandum (9/25/2009):

“130,000 new residents per year move into the Bay watershed. For every 8% increase in the population impervious surfaces (roads, parking lots, etc.) increase by 41%.”

National Resources Defense Council, *NRDC’s Plan to Clean Up the Chesapeake Bay and Its Beaches* (October 2009):

“Between 1990 and 2000, the population in the Bay watershed increased 8 percent, while developed areas increased by a disproportionate 41 percent.”

³ U.S. Census Bureau data from <http://quickfacts.census.gov/qfd/states/11000.html>, last accessed on February 23, 2010, indicates that the land area of the District of Columbia is 61.40 square miles, or 39,296 acres. Based on this information, 250,000 acres is approximately 6.4 times the size of the District of Columbia.

Kim Coble, Maryland Executive Director of the Chesapeake Bay Foundation, *An Op-Ed Response – Chesapeake Bay Foundation: New Stormwater Rules Won't Increase Costs* (Center Maryland article posted to its website on February 12, 2010):

“Between 1990 and 2000 alone, our region's population grew by 8%, but the amount of land paved or covered with buildings and concrete increased by 41%.”

REVIEW OF THE POPULATION INCREASE CLAIM

In reviewing the population component of the data used to create Chart 1, WSSI found a discrepancy between the population data file and the Website claim. The file named, “population2008.xls,”⁴ indicates that the population of the Chesapeake Bay watershed grew by **10.3%** during the 1990-2000 time period, rather than 8% as stated on the website from which the file was downloaded. (The file indicates that the information was updated 2/2/09.)

We believe this 10.3% estimate is correct based on our analysis of U.S. Census data. WSSI downloaded data from <http://www.census.gov>⁵ for each county within the Chesapeake Bay watershed to determine the population increase from 1985 to 2008. In instances where a county was bisected by the watershed boundary, the population within the county was calculated as the total county population times the ratio of the land within the watershed to the total countywide acreage. WSSI recognizes that this methodology inherently introduces error into the equation, but the resulting population data matches well with the data in the “population2008.xls” file downloaded from the chesapeakebay.net website. Therefore, we concur with the data presented therein (with the aforementioned caveat that the chesapeakebay.net website statement does not match the available downloadable data from the same website.

We also note that we calculated these population figures using county boundaries from Environmental Systems Research Institute, Inc. (ESRI) and checked them against calculations utilizing U.S. Census Topographically-Integrated Geographic Encoding and Referencing (TIGER) system boundaries from 1990, 2000, and 2008. The variances between the two methods were less than 1% in all cases except for Delaware (which had variances up to 18.5%). Since the overall watershed variation was less than 0.5%, we did not investigate the variances in further detail, and we incorporated the population data that utilized the ESRI boundaries into this analysis.

REVIEW OF THE IMPERVIOUS AREA INCREASE CLAIM

In reviewing the population increase vs. impervious area increase claim, however, it has become apparent that the percent change in impervious area shown in Chart 1 does not match the percent change in impervious area calculated using information from the Phase 5.2 Chesapeake Bay Watershed Model (the “Phase 5.2 model”), which was the latest model available at the time of this review and therefore, presumably, the most accurate. This presumption is corroborated by the data sources used to create the two data sets. The impervious area data used to create Chart

⁴ Downloaded from http://www.chesapeakebay.net/status_population.aspx?menuitem=19842 on February 19, 2010.

⁵ Specifically, WSSI downloaded the files: <http://www.census.gov/popest/archives/1980s/e8089co.xls>, <http://www.census.gov/popest/archives/1990s/CO-99-08.html>, <http://www.census.gov/popest/counties/files/CO-EST2008-alldata.pdf>, and <http://www.census.gov/popest/counties/files/CO-EST2008-ALLDATA.csv>

1, above, came from the University of Maryland’s Regional Earth Sciences Applications Center (RESAC). However, the impervious area data used within the Phase 5.2 model came from:

- (RESAC) 2000 land cover data;
- USGS’s 1992 National Land Cover Dataset (NLCD);
- Agricultural Census data;
- Population and Housing Census data;
- GIS road network overlays (Tele Atlas 2004);
- Maryland construction permit data; and
- National Pollutant Discharge Elimination System (NPDES) permit data.⁶

WSSI IMPERVIOUS AREA INCREASE METHODOLOGY

WSSI used the Phase 5.2 Chesapeake Bay Community Watershed Model (the “Phase 5.2 Model”) results from the file, “P52_Loads-Acres_111609.xls,” dated January 4, 2010, downloaded from ftp://ftp.chesapeakebay.net/Modeling/phase5/Phase52_Loads-Acres-BMPs/, as the basis for determining the percent increase in impervious area.

The “IU” (impervious urban) category in the Phase 5.2 model is comprised of the “imh” (high-intensity impervious urban) and “iml” (low-intensity impervious urban) categories. WSSI graphed the IU category for the three years simulated with the Phase 5.2 model (1985, 2002, and 2008) to determine the percentage increase in impervious area over the entire Chesapeake Bay watershed between 1985 and 2008:

	1985	2002	2008	Increase 1985-2008
imh	375,013	467,712	512,327	36.6%
iml	260,037	332,505	366,547	40.9%
IU	635,050	800,217	878,874	38.4%

Table 1. Impervious area in the Chesapeake Bay watershed based on the Phase 5.2 Chesapeake Bay Model.

WSSI then performed a linear interpolation between 1985 and 2002 to determine the percentage increase between 1990 and 2000 (because the 5.2 Model only provides data for 1985, 2002, and 2008):

Overall Chesapeake Bay Watershed	1985	1990	2000	2002	Increase 1990-2000
IU with Linear Interpolation	635,050	683,628	780,785	800,217	14.2% ⁷

Table 2. Linear interpolation of the impervious area in the Chesapeake Bay watershed (based on the Phase 5.2 Chesapeake Bay Model) between 1985 and 2002.

⁶ USEPA, (U.S. Environmental Protection Agency). 2008. *Chesapeake Bay Phase 5 Community Watershed Model. In preparation* EPA XXX-X-XX-008. U.S. Environmental Protection Agency, Chesapeake Bay Program Office, Annapolis MD. January 2008.

⁷ As a verification, a polynomial interpolation of the same data yielded a similar, although slightly higher, increase in impervious area change: 15.1%

WSSI performed the same calculations for the District of Columbia and each state within the Chesapeake Bay watershed.

RESULTS OF IMPERVIOUS AREA ANALYSIS

The results of WSSI's analysis for the individual states, as well as for the Chesapeake Bay watershed as a whole, are shown in the following table and charts (also see Appendix B):

Jurisdiction (portion within the Chesapeake Bay watershed)	1990		2000	
	Population	Impervious Area (acres)	Population	Impervious Area (acres)
Chesapeake Bay Watershed	14,250,226	683,628	15,715,448	780,785
Delaware	138,211	7,952	170,282	10,212
District of Columbia	606,900	17,588	572,059	17,919
Maryland	4,748,709	210,980	5,258,913	242,976
New York	684,310	27,852	669,549	28,874
Pennsylvania	3,395,524	191,390	3,579,049	211,755
Virginia	4,494,087	220,001	5,250,248	259,530
West Virginia	182,486	7,866	215,348	9,519

Table 3. Population and area data for the Chesapeake Bay watershed and individual states (based on the Phase 5.2 Chesapeake Bay model) for 1990 and 2000.

Jurisdiction (portion within the Chesapeake Bay watershed)	Population Increase (1990-2000) (%)	Impervious Area Increase (1990-2000) (%)
Chesapeake Bay Watershed	10.3%	14.2%
Delaware	23.2%	28.4%
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New York	-2.2%	3.7%
Pennsylvania	5.4%	10.6%
Virginia	16.8%	18.0%
West Virginia	18.0%	21.0%

Table 4. Population and area increases between 1990 and 2000 (based on a linear interpolation of the Phase 5.2 Chesapeake Bay model results).

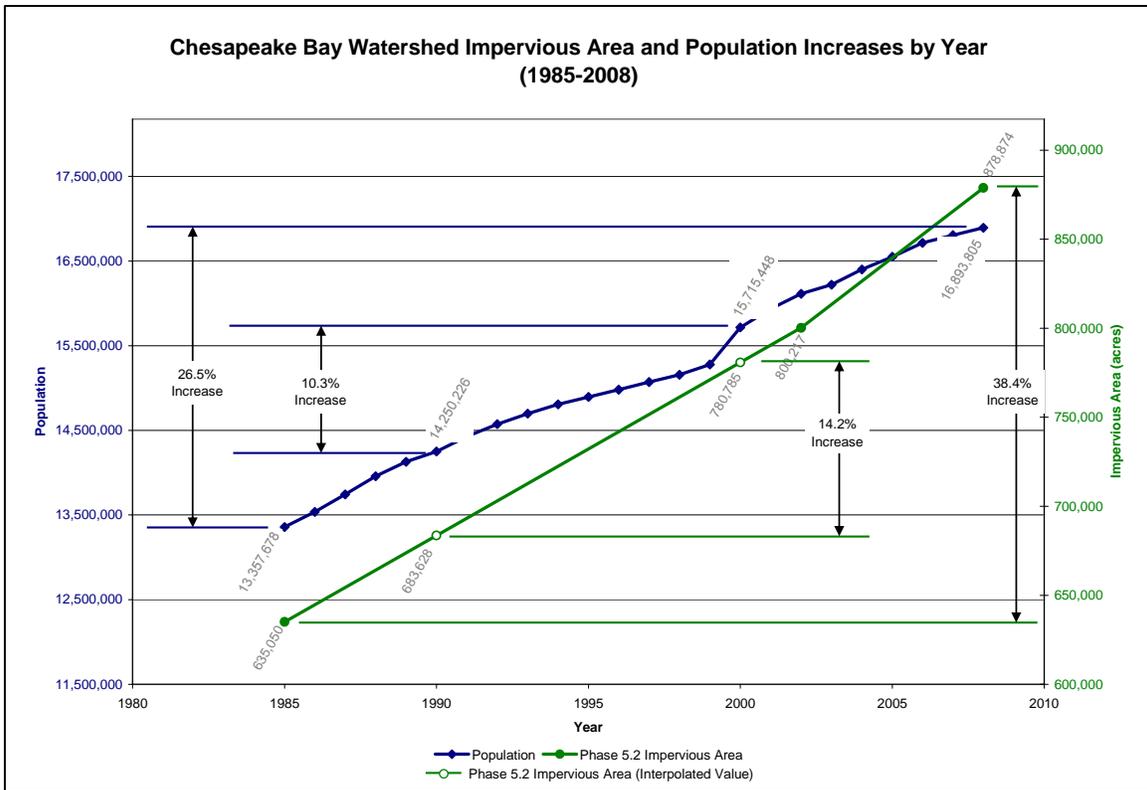


Figure 3. Chesapeake Bay watershed impervious area and population increases by year.

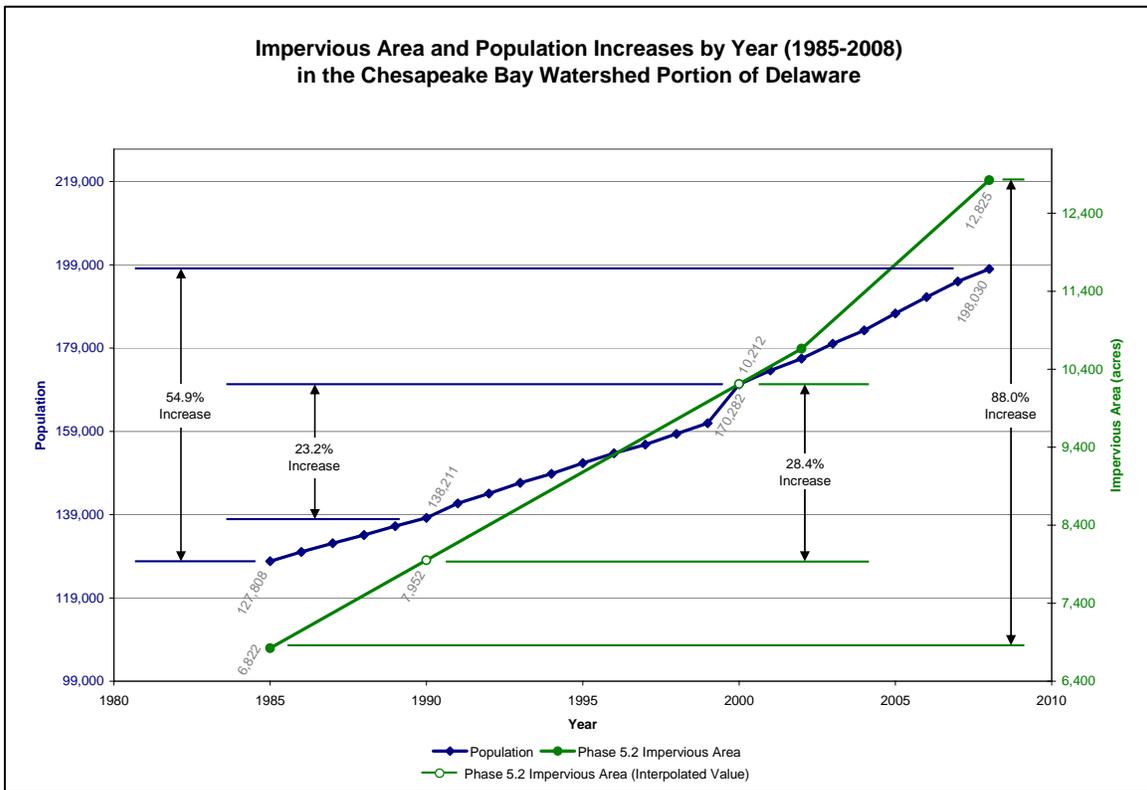


Figure 4. Delaware (within the Chesapeake Bay watershed) impervious area and population increase.

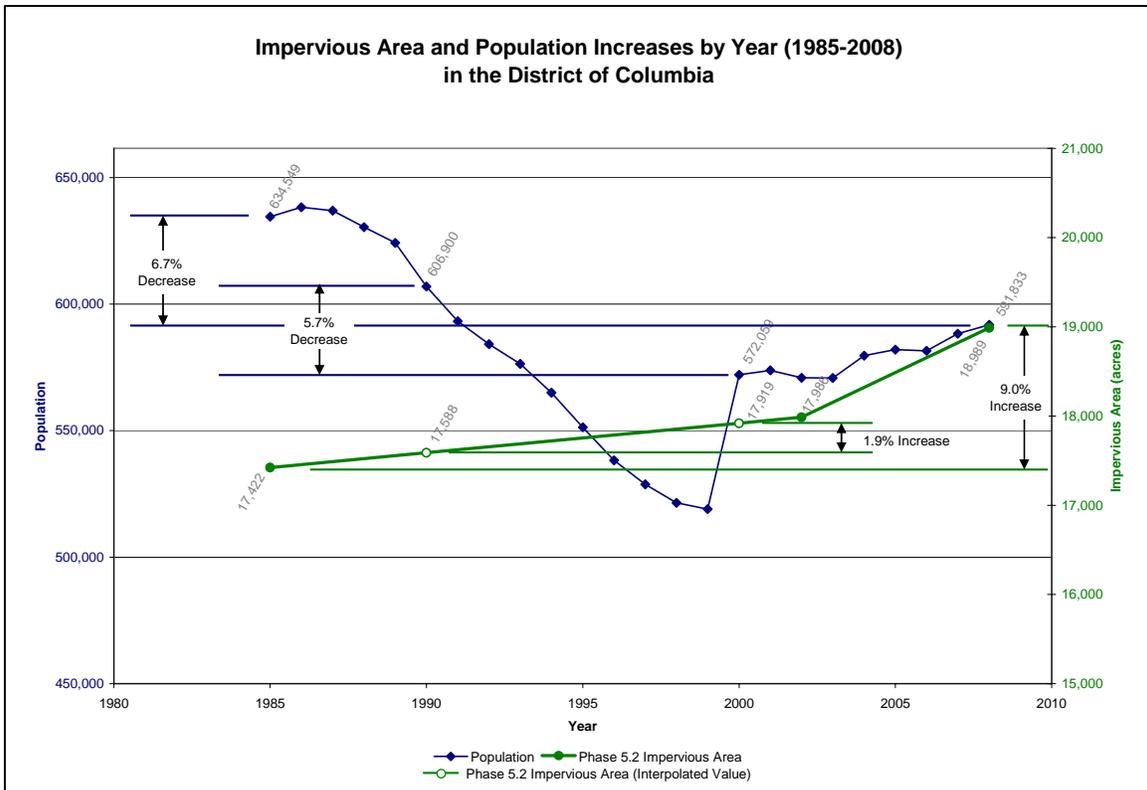


Figure 5. District of Columbia (within the Chesapeake Bay watershed) impervious area and population increase.

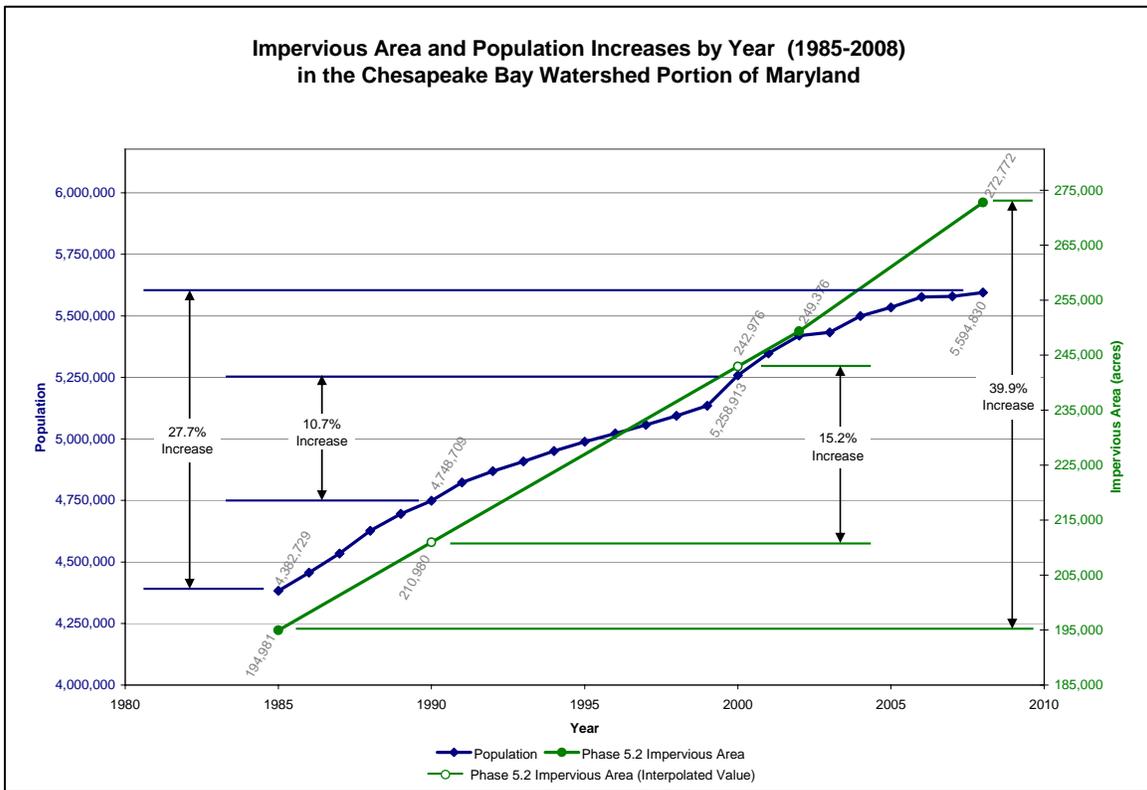


Figure 6. Maryland (within the Chesapeake Bay watershed) impervious area and population increase.

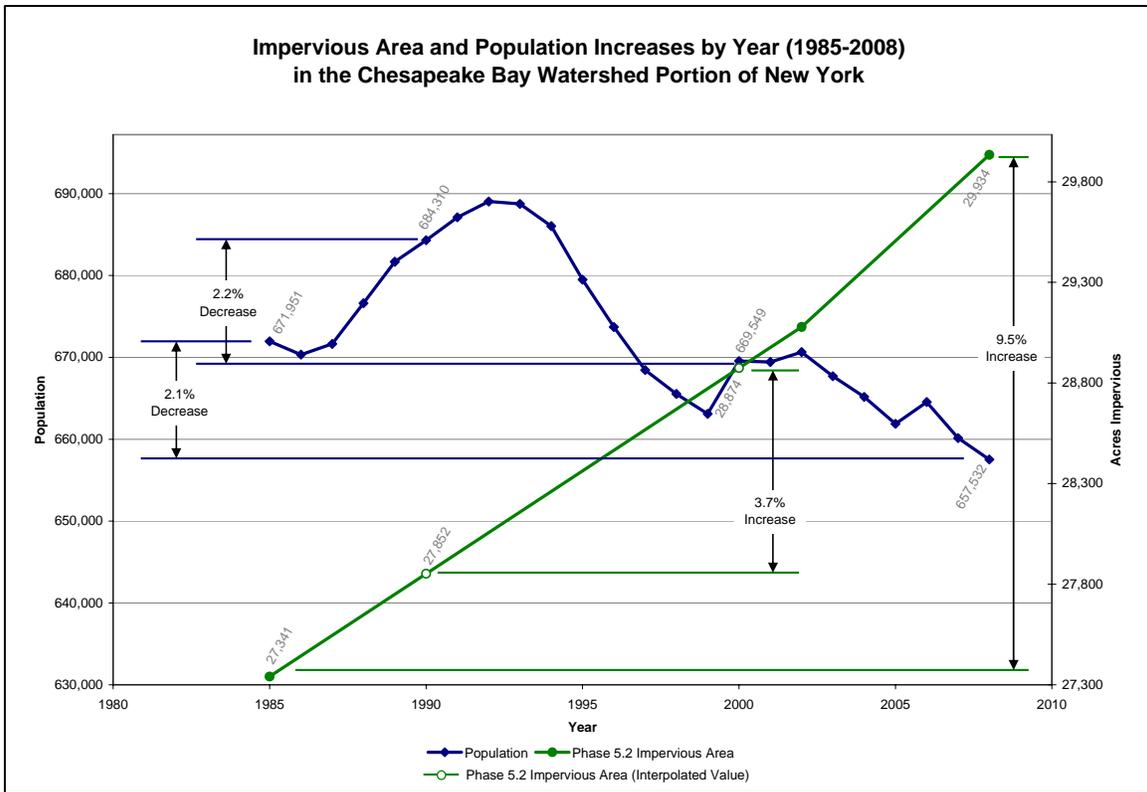


Figure 7. New York (within the Chesapeake Bay watershed) impervious area and population increase.

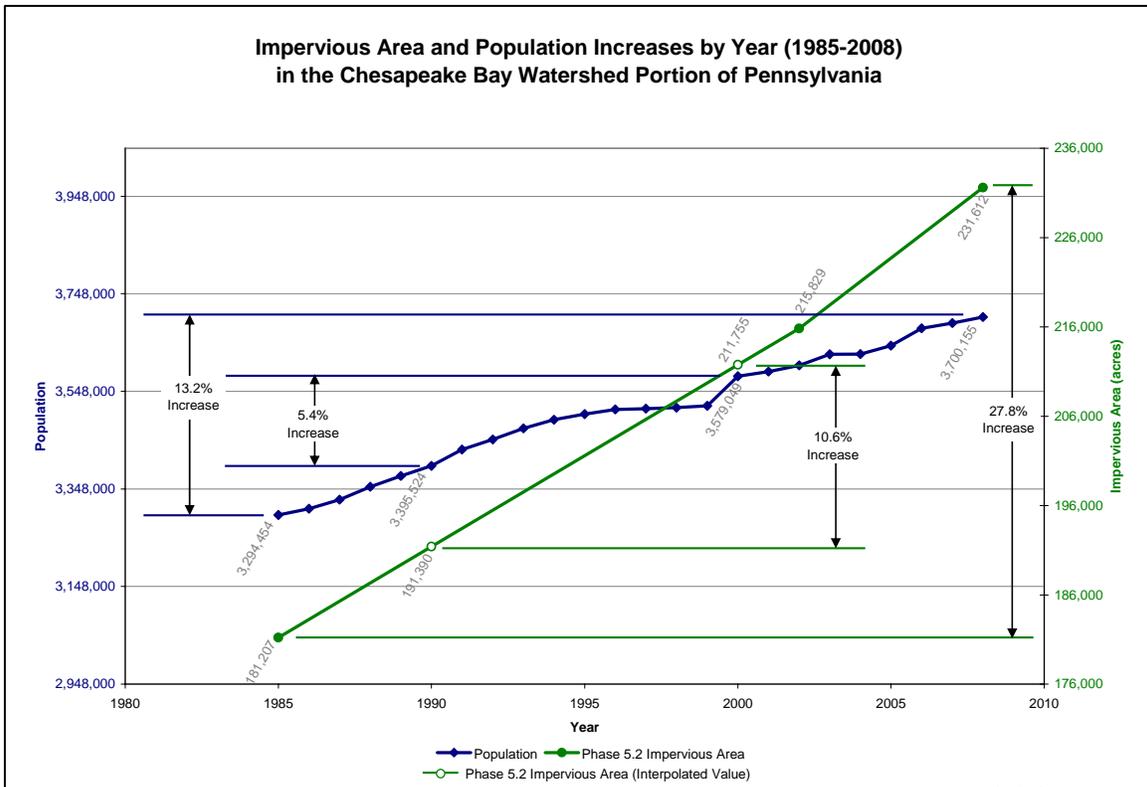


Figure 8. Pennsylvania (within the Chesapeake Bay watershed) impervious area and population increase.

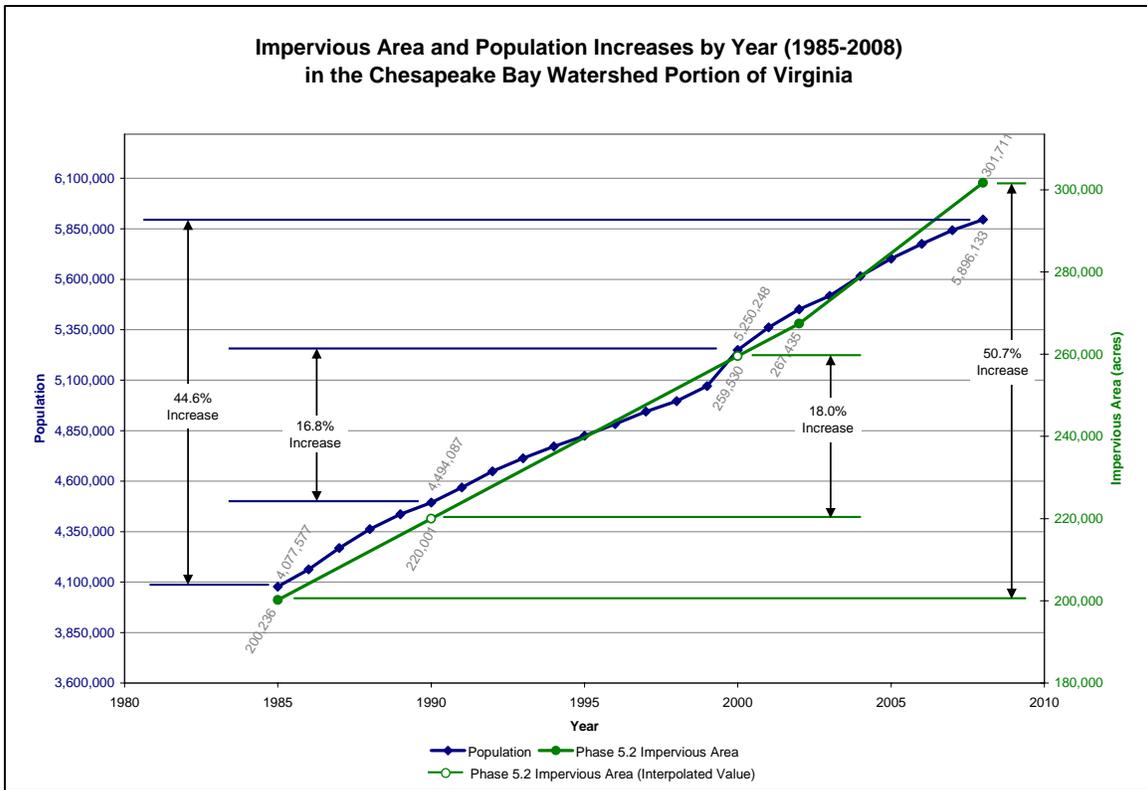


Figure 9. Virginia (within the Chesapeake Bay watershed) impervious area and population increase.

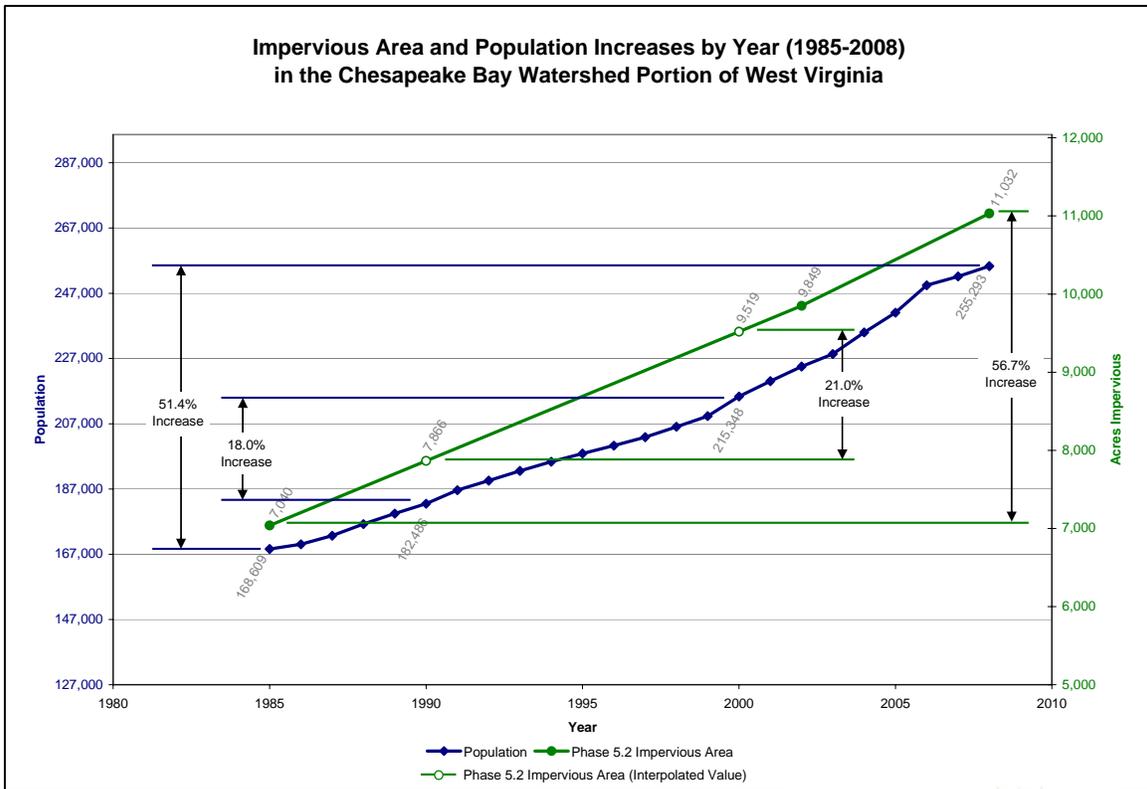


Figure 10. West Virginia (within the Chesapeake Bay watershed) impervious area and population increase.

CONCLUSION

We believe this discrepancy in population increase vs. impervious area increase occurred because the website and background data were not updated with new information as the model was revised. Timestamps on the background data sets used to determine the 41% increase indicate that the calculation was done in or around 2003. Documentation for the Phase 5.2 model indicates that the GIS dataset was updated with information from 2004 and beyond, thus making it more refined than the initial estimate.

Therefore, WSSI respectfully submits that the website should be revised to state that the population of the Chesapeake Bay watershed grew by 10.3% while the impervious area grew by 14.2%. Additionally, because this statistic has been used in so many venues, this new information should be broadcast to the general public, and S.1816/H.R.3852 should be revised to utilize the most up-to-date information:

(13) during the period beginning in 1990 and ending in 2000, impervious cover, the hardened surfaces through which water cannot penetrate, increased by approximately 97,000 acres, about 14.2 percent, or the size of 2.5 Districts of Columbia;

(14) during that period, the watershed population of the Chesapeake Bay grew by 10.3 percent.

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Appendix A

Sources Citing the Claim of 8% Population Increase and 41% Impervious Area Increase

1. Screen capture of www.chesapeakebay.net
(http://www.chesapeakebay.net/status_population.aspx?menuitem=19842)
2. Senate Bill S.1816, *A Bill to Amend the Federal Water Pollution Control Act to Improve and Reauthorize the Chesapeake Bay Program*, submitted by Senator Cardin [D-MD], and H.R.3852, of the same name, submitted by Representative Cummings [D-MD] (pages 1-4 only)
3. Testimony of J. Charles Fox, Senior Advisor to Administrator Lisa P. Jackson, U.S. Environmental Protection Agency before the Subcommittee on Water Resources and Environment Committee on Transportation and Infrastructure, U.S. House of Representatives (9/22/2009)
4. National Resources Conservation Service Memorandum (9/25/2009)
5. National Resources Defense Council, *NRDC's Plan to Clean Up the Chesapeake Bay and Its Beaches* (October 2009)
6. Kim Coble, Maryland Executive Director of the Chesapeake Bay Foundation, *An Op-Ed Response – Chesapeake Bay Foundation: New Stormwater Rules Won't Increase Costs* (*Center Maryland* article posted to its website on February 12, 2010)



- General Info
- News & Press

Home > Bay Pressures > Land & People > Impervious Surfaces > How's It Doing

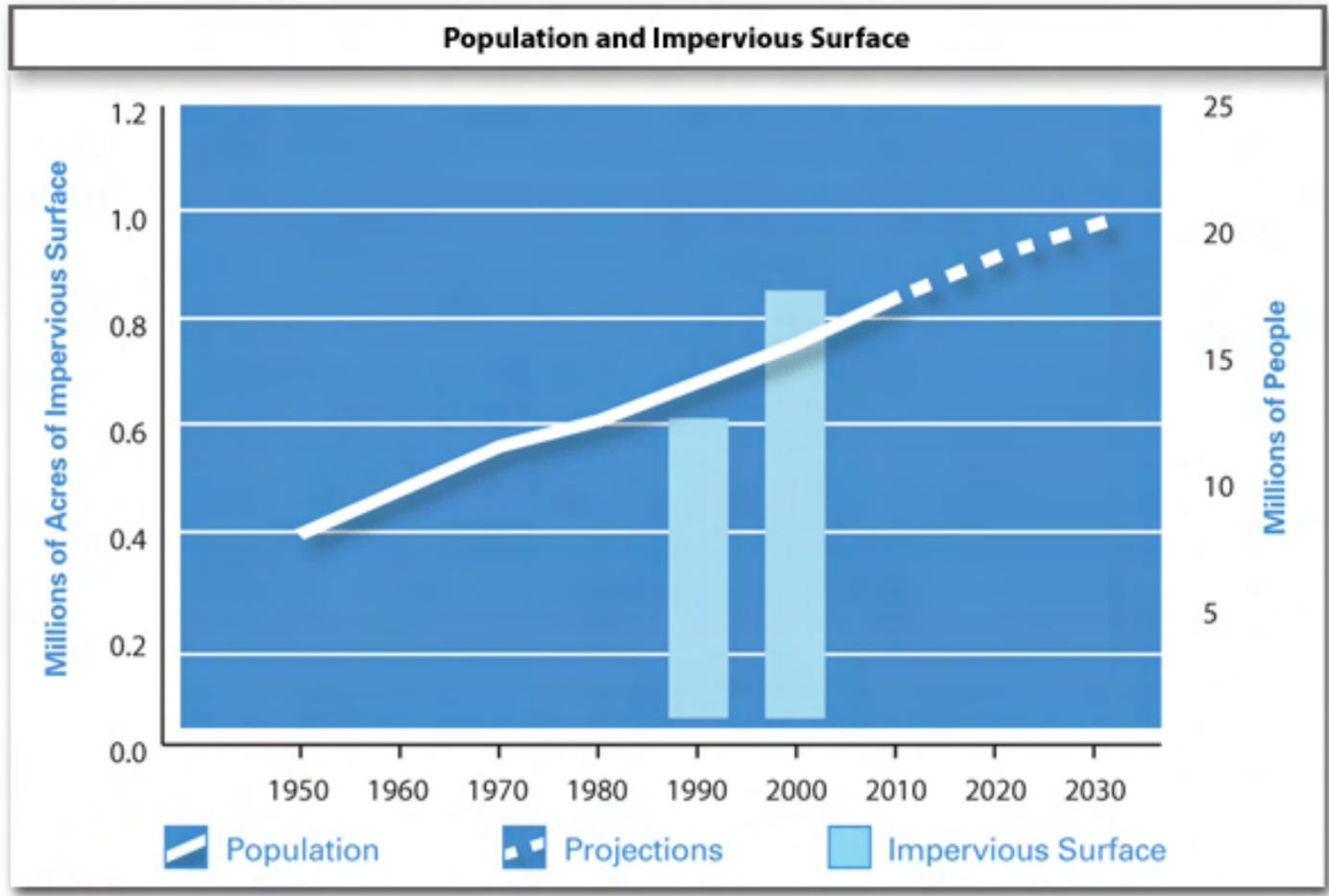
Bay Watershed Population and Impervious Surface

16,797,132 people live in the watershed.

- How's It Doing
- Photos
- Publications
- Maps

Assessment

By Chart By Geography



Download Data File Download This Slide Download Analysis & Methods

Importance

The way humans use the land has the greatest impact on the Bay and local waterways. Natural areas like [forests](#) and [wetlands](#) have a positive effect on water quality, while areas developed for [farming](#) or [cities](#) generally have a

Importance

The way humans use the land has the greatest impact on the Bay and local waterways. Natural areas like [forests](#) and [wetlands](#) have a positive effect on water quality, while areas developed for [farming](#) or [cities](#) generally have a negative impact.

The decline of the Chesapeake Bay is directly linked to the rise in population in the watershed: since 1950, the number of residents has doubled. Projections through 2030 show continued [population growth](#), loss of natural areas and increases in urban [development](#), which are all challenges to protecting and restoring the Chesapeake.

Even more influential than population growth is the corresponding development. People are moving into sprawling suburbs and living in bigger houses on larger lots, causing forests, farms and other valuable lands to be transformed into subdivisions, shopping centers and parking lots. This land conversion severely impacts the health of streams, rivers and the Bay.

[Impervious surfaces](#) such as roads and rooftops do not allow water to filter into the ground. Instead rainfall runs off, picking up pollution and quickly carrying it into waterways. From 1990 to 2000, impervious surfaces increased by 41 percent – a rate five times greater than the 8 percent rate of population growth during that time.

Goal

The indicator is not related to a goal at this time.

Trends

Long-term trend (since start of data collection)

From 1950 through 2007, the Bay watershed population increased from 8,385,982 to 16,797,132.

Short-term trend (10-year trend)

The 10-year trend is not available, since the most recent annual data points are 2000 through 2007. During this time, population increased from 15,700,408 to 16,797,132.

Change from previous year (2006-2007)

Population increased from 16,684,893 to 16,797,132.

Additional Information

Future Population Growth and Tracking

Experts predict that the watershed’s population will increase to nearly 20 million by 2030.

In the future, the Bay Program will track change in developed area rather than change in impervious surfaces. Impervious surfaces are a sub-category of developed lands.

Population Growth vs. Impervious Surfaces

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Population Growth vs. Impervious Surfaces

The land area of the Chesapeake Bay watershed is 64,000 square miles or ~40.9 million acres. The total acreage of impervious surfaces in the watershed in 1990 was 602,766 acres and in 2000 was 848,727 acres - an increase of 245,961 acres or 40.8 percent.

Variations in Population Growth

While the overall population of the Bay watershed continues to grow, population changes vary from state to state and region to region. Some areas are gaining population at a high rate, while populations in other areas are leveling out or declining.

Contact

For more information contact: [Peter Claggett](#) at 800-968-7229 ext. 771

Source of Data

Chesapeake Bay Program

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Print Version

Send Comments

111TH CONGRESS
1ST SESSION

S. 1816

To amend the Federal Water Pollution Control Act to improve and reauthorize the Chesapeake Bay Program.

IN THE SENATE OF THE UNITED STATES

OCTOBER 20, 2009

Mr. CARDIN (for himself, Ms. MIKULSKI, Mr. CARPER, and Mr. KAUFMAN) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

A BILL

To amend the Federal Water Pollution Control Act to improve and reauthorize the Chesapeake Bay Program.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Chesapeake Clean
5 Water and Ecosystem Restoration Act of 2009”.

6 **SEC. 2. FINDINGS.**

7 Congress finds that—

8 (1) the Chesapeake Bay and the tributary wa-
9 ters of the Chesapeake Bay are natural resources of

1 outstanding ecological, economic, and cultural im-
2 portance to the United States;

3 (2) for more than 20 years, the Federal Gov-
4 ernment and the States of the Chesapeake Bay Wa-
5 tershed, the Chesapeake Bay Commission, and var-
6 ious local government, scientific, and citizen advisory
7 boards have worked through the Chesapeake Bay
8 Program of the Environmental Protection Agency to
9 develop an unparalleled body of scientific informa-
10 tion and cooperative partnerships to advance the
11 Chesapeake Bay restoration effort;

12 (3) despite significant efforts by Federal, State,
13 and local governments and other interested parties,
14 water pollution in the Chesapeake Bay prevents the
15 attainment of existing State water quality standards
16 and the ecological goals of the Federal Water Pollu-
17 tion Control Act (33 U.S.C. 1251 et seq.);

18 (4) the Chesapeake Bay Program partnership
19 has developed a rich body of environmental data
20 based on an extensive network of monitors, which
21 provide a critical measure of success in attainment
22 of the goals of the restoration effort;

23 (5) the Chesapeake Bay Program partnership
24 has also developed some of the world's foremost

1 water quality and ecosystem computer models, which
2 are invaluable planning tools for resource managers;

3 (6) the major pollutants affecting the water
4 quality of the Chesapeake Bay and related tidal wa-
5 ters are nitrogen, phosphorus, and sediment;

6 (7) the largest developed land use in the Chesa-
7 peake Bay watershed, and the largest single-sector
8 source of nitrogen, phosphorus, and sediment pollu-
9 tion, is agriculture;

10 (8) conservation practices have resulted in sig-
11 nificant reductions in pollution loads from the agri-
12 cultural sector;

13 (9) to speed continued progress in the agricul-
14 tural sector, the Federal Government and State gov-
15 ernments have initiated a number of agricultural
16 conservation programs, including the Chesapeake
17 Bay watershed initiative under section 1240Q of the
18 Food Security Act of 1985 (16 U.S.C. 3839bb-4);

19 (10) atmospheric deposition of nitrogen oxides
20 and ammonia on the Chesapeake Bay watershed
21 contributes as much as $\frac{1}{3}$ of the nitrogen pollution
22 in the Chesapeake Bay;

23 (11) for years, a steady stream of technology
24 development and increasingly stringent permit re-
25 quirements have resulted in a steady decline in the

1 nitrogen and phosphorus pollution derived from
2 wastewater treatment plants in the Chesapeake Bay
3 watershed;

4 (12) suburban and urban development is the
5 fastest growing land use sector in the Chesapeake
6 Bay watershed, and stormwater runoff from that
7 sector is the only major source of pollution in the
8 watershed that is increasing;

9 (13) during the period beginning in 1990 and
10 ending in 2000, impervious cover, the hardened sur-
11 faces through which water cannot penetrate, in-
12 creased by nearly 250,000 acres, about 41 percent,
13 or the size of 5 Districts of Columbia;

14 (14) during that period, the watershed popu-
15 lation of the Chesapeake Bay grew by just 8 per-
16 cent;

17 (15) the population of the watershed is esti-
18 mated to be growing by about 157,000 people per
19 year;

20 (16) continuing at that rate, the population will
21 increase to nearly 20,000,000 by 2030;

22 (17) about 58 percent of the watershed of the
23 Chesapeake Bay is undeveloped and mostly forested,
24 but as many as 100 acres of forest are lost to devel-
25 opment each day;

111TH CONGRESS
1ST SESSION

H. R. 3852

To amend the Federal Water Pollution Control Act to improve and reauthorize the Chesapeake Bay Program.

IN THE HOUSE OF REPRESENTATIVES

OCTOBER 20, 2009

Mr. CUMMINGS (for himself, Mr. CONNOLLY of Virginia, Mr. VAN HOLLEN, Mr. SARBANES, Mr. MORAN of Virginia, Ms. EDWARDS of Maryland, Ms. NORTON, Mr. SCOTT of Virginia, Mr. HOYER, Mr. OBERSTAR, and Ms. EDDIE BERNICE JOHNSON of Texas) introduced the following bill; which was referred to the Committee on Transportation and Infrastructure

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8 source of nitrogen, phosphorus, and sediment pollu-
9 tion, is agriculture;

10 (8) successful implementation of conservation
11 practices have resulted in significant reductions in
12 pollutant loads from the agricultural sector;

13 (9) to speed continued progress in the agricul-
14 tural sector, the Federal Government and State gov-
15 ernments have initiated a number of agricultural
16 conservation programs, including the Chesapeake
17 Bay watershed initiative under section 1240Q of the
18 Food Security Act of 1985 (16 U.S.C. 3839bb-4);

19 (10) atmospheric deposition of nitrogen oxides
20 and ammonia on the Chesapeake Bay watershed
21 contributes as much as $\frac{1}{3}$ of the nitrogen pollution
22 in the Chesapeake Bay;

23 (11) for years, a steady stream of technology
24 development and increasingly stringent permit re-
25 quirements have resulted in a steady decline in the

1 nitrogen and phosphorus pollution derived from
2 wastewater treatment plants in the Chesapeake Bay
3 watershed;

4 (12) suburban and urban development is the
5 fastest growing land use sector in the Chesapeake
6 Bay watershed, and stormwater runoff from that
7 sector is the only major source of pollution in the
8 watershed that is increasing;

9 (13) during the period beginning in 1990 and
10 ending in 2000, impervious cover, the hardened sur-
11 faces through which water cannot penetrate, in-
12 creased by nearly 250,000 acres, about 41 percent,
13 or the size of 5 Districts of Columbia;

14 (14) during that period, the population of the
15 Chesapeake Bay watershed grew by just 8 percent;

16 (15) the population of the watershed is esti-
17 mated to be growing by about 157,000 people per
18 year;

19 (16) continuing at that rate, the population will
20 increase to nearly 20,000,000 by 2030;

21 (17) about 58 percent of the watershed of the
22 Chesapeake Bay is undeveloped and mostly forested,
23 but as many as 100 hundred acres of forest are lost
24 to development each day;

**TESTIMONY OF J. CHARLES FOX
SENIOR ADVISOR TO ADMINISTRATOR LISA P. JACKSON
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEE ON WATER RESOURCES AND ENVIRONMENT
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
U.S. HOUSE OF REPRESENTATIVES**

September 22, 2009

Madame Chairwoman and members of the Subcommittee, I am J. Charles Fox, Senior Advisor to Administrator Lisa P. Jackson at the U.S. Environmental Protection Agency (EPA). Thank you for the invitation to speak today on reauthorizing the Chesapeake Bay Program. We appreciate greatly the leadership of this Subcommittee on the Chesapeake and we look forward to working closely with you in the weeks and months ahead.

Our testimony will describe the actions of EPA and other federal agencies in implementing President Obama's Executive Order on Chesapeake Bay Protection and Restoration. Collectively, the federal family is committed to a new generation of federal leadership which is characterized by new levels of accountability, performance, partnership and innovation to help protect and restore the Bay and its tributaries to a healthy condition.

The Scope and Complexity of the Watershed and Bay

The Chesapeake Bay watershed encompasses 64,000 square miles, parts of six States and the District of Columbia. Nearly 17 million people live in the watershed. The land mass of the Bay watershed is sixteen times the size of the Bay, a ratio higher than any other estuary in the world. This means that our actions on the land have a profound impact on our local streams, rivers and, ultimately the Bay.

The Chesapeake Bay is the largest estuary in North America and is ecologically, economically and culturally critical to the region and the country. It is home to more than 3,600 species of fish, plants and animals. For more than 300 years, the Bay and its tributaries have sustained the region's economy and defined its traditions and culture. The economic value of the Bay is estimated at more than \$1 trillion¹ and two of the five largest Atlantic ports (Baltimore and Norfolk) are located in the Bay.

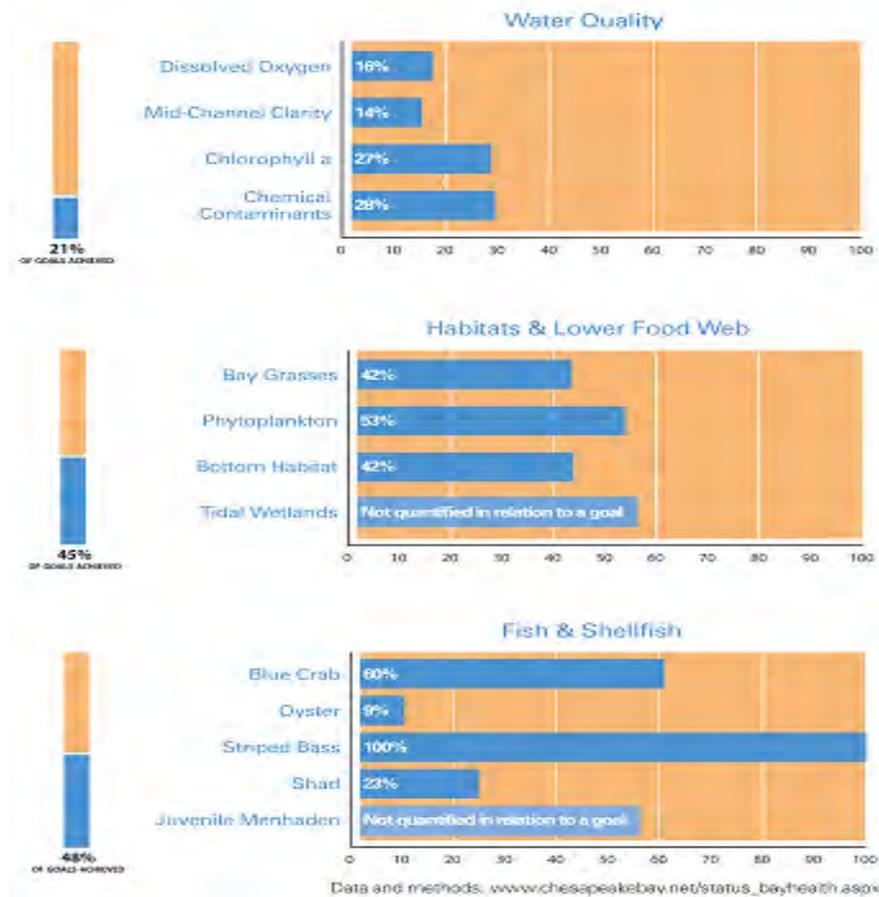
The Health of the Bay

In March 2009, the Chesapeake Bay Program issued its annual Health and Restoration Assessment of the Chesapeake Bay and Watershed, also referred to as the "Bay Barometer." A copy of the Executive Summary has been provided to the Chair and Members of the Subcommittee.

¹ *Saving a National Treasure: Financing the Cleanup of the Chesapeake Bay*, A Report to the Chesapeake Bay Executive Council, Chesapeake Bay Blue Ribbon Finance Panel, October 27, 2004

The Bay Barometer affirms what we all know. Despite the impressive restoration work done by the array of partners, the health of the Bay and watershed remains severely degraded. The data included in this report are sobering. Virtually all of the 13 measures which comprise Bay health show very limited progress (water quality, habitats and lower food web and fish and shellfish) (see Figure 1). There have been positive improvements in the population of striped bass, which is generally attributed to the actions by Maryland, Virginia and other east coast states to limit harvest pressure years ago, although this population has been stressed in recent years by a high incidence of mycobacteriosis.

Figure 1. Chesapeake Bay Measures of Health Progress (2008)



In general, the Bay Program partners have made some important – but not sufficient -- progress to reduce nutrient pollution from agriculture and wastewater treatment plants. Agriculture is the single largest source of nutrient and sediment pollution to the Bay, with about half of that load directly related to animal manure. However, the pollution from urban and suburban stormwater has an increasingly large impact on the Bay's water quality.

The negative trend in nutrient and sediment pollution from stormwater is directly linked to the rise in population and land use patterns in the watershed. Since 1950, the number of residents has doubled. Experts predict that population will continue to rise through the next three decades, topping 19 million in 2020.

Impervious surfaces, such as roads and rooftops, increased by 41% compared to an 8% increase in population from 1990-2000. Low density, disconnected development -- commonly referred to as sprawl -- has been the predominant form of development in the Bay watershed for the past several decades. New development that is spread-out, far from existing communities, schools, wastewater treatment facilities, shopping, and jobs explains the disparity between the rate of population growth and the increase in impervious surfaces.

Impervious surfaces do not allow water to filter into the ground. Instead, rainfall runs off, picking up pollution and quickly carrying it into waterways. Projections through

2030 show continued population growth, which could result in the loss of natural areas if we continue the development patterns of recent decades. People are coming to the Chesapeake Bay watershed. Where and how these people are accommodated will have a profound influence on the health of the Bay.

Executive Order 13508

On May 12, 2009, President Obama presented all citizens who cherish the Chesapeake with an historic opportunity when he signed an Executive Order on Chesapeake Bay Protection and Restoration, directing a new era of federal leadership on the Chesapeake Bay. The Executive Order acknowledged that the efforts of the past 25 years to reduce pollution and clean up the Bay and its tributaries have yielded some progress. However, it concluded that the poor health of the Chesapeake remains one of our nation's most significant environmental challenges. Indeed, Administrator Jackson has emphasized repeatedly that communities in the Chesapeake Bay watershed expect and deserve rivers and streams that are healthy and thriving.

The Executive Order created a Federal Leadership Committee, chaired by EPA, to strengthen the role of the federal government in the Bay restoration and align the capabilities of EPA, and Departments of the Interior, Commerce, Agricultural, Defense, Homeland Security, and Transportation. The Order directed federal agencies to prepare seven draft reports within 120 days addressing key challenges to the Chesapeake Bay, ranging from improving water quality to expanding public access to the Bay and its

tributaries. Last week, the Federal Leadership Committee received the seven draft reports for review. The draft reports focus on a number of recommendations that include:

- **Define the next generation of tools and actions to restore water quality** in the Chesapeake Bay and describe changes to be made to regulations, programs and policies to implement these actions (led by EPA).
- **Target resources** to better protect the Chesapeake Bay and its rivers (led by USDA).
- **Strengthen storm water management practices** at federal facilities and on federal lands within the Chesapeake Bay watershed and develop storm water best practices guidance (led by DOD).
- **Assess the impacts of climate change** and develop a strategy for adapting to those impacts on water quality and living resources (led by DOI and NOAA).
- **Expand public access** to waters and open spaces of the Bay and its tributaries (led by DOI).
- **Strengthen monitoring** and decision support for ecosystem management (led by DOI and NOAA).
- Focus and coordinate habitat and research activities that **protect and restore living resources** and water quality (led by DOI and NOAA).

The draft reports are available online at: <http://executiveorder.chesapeakebay.net>

The reports outline four broad tenets of new federal leadership:

1. Increasing accountability and performance from pollution control, habitat protection and land conservation programs at all levels of government;
2. Expanding use of regulatory authorities to assure reductions in nitrogen, phosphorus and sediment pollution to the Bay and its tributaries;
3. Expanding targeting of technical and financial resources to improve efficiency and secure better outcomes; and,

4. Harnessing technological innovations and making these tools accessible and meaningful to the states, D.C. and local communities whose decisions are fundamental to protection and restoration of the Bay.

Draft 202(a) Report on Water Quality

The Executive Order's draft report on water quality, which was prepared by EPA, defined three principal mechanisms to achieving water quality objectives in Chesapeake Bay and its tributaries:

1. Create a new accountability program to guide federal and state water quality efforts;
2. Initiate new federal rulemakings and other actions under the Clean Water Act and other authorities; and,
3. Establish an enhanced partnership between USDA and EPA to implement a "Healthy Bay – Thriving Agriculture" Initiative.

The proposed new accountability framework builds on Sections 117(g) and the "Total Maximum Daily Load" (TMDL) provisions under section 303(d) of the Clean Water Act to set new expectations to guide state and federal efforts for reducing nutrient and sediment pollution. Specifically, EPA proposes to define more precisely the criteria it would use to approve implementation strategies, including its intention to rely heavily upon enforceable or otherwise binding programs.

The proposed accountability framework also proposes that EPA would identify a number of potential consequences that it may use in the event that jurisdictions do not commit to establish and implement effective restoration programs or do not achieve interim milestones. These consequences would include, but are not limited to:

- Revising the draft or final pollutant reduction allocations in the Bay TMDL that EPA will establish in December 2010 to assign more stringent pollutant reduction responsibilities to point and non-point sources of nutrient and sediment pollution;
- Objecting to state-issued CWA National Pollutant Discharge Elimination System (NPDES) permits;
- Acting to limit or prohibit new or expanded discharges of nutrients and sediments;
- Withholding, conditioning, or reallocating federal grant funds; and,
- Taking other actions as appropriate.

The draft water quality report also cites potential changes in regulations under the Clean Water Act to reduce pollution from concentrated animal feeding operations (CAFOs), stormwater, and new or expanding discharges of nutrients and sediment. With these rulemakings, EPA would significantly strengthen or clarify federal requirements that would further limit nutrient and sediment discharges to the Bay.

In a rulemaking for CAFOs, EPA would consider a number of potential changes including regulating more animal feeding operations as CAFOs. EPA would also consider revising minimum nutrient management planning elements in the current CAFO rule to better define agricultural practices essential for load reductions based on sound science and adaptive management principles.

To deal with storm water – a growing and urgent issue – EPA would consider revising its stormwater regulations to include additional high-growth areas and establish stronger minimum performance standards in stormwater permits.

EPA would also consider a rulemaking to clarify, at a minimum, how permitting authorities can authorize new or increased discharges related to population growth and development in the context of managing overall pollutant loads into impaired waters. Such a rule could address how high priority point source load increases can be managed so that the resultant load will be protective of water quality standards and achieve the goals of the President's Chesapeake Bay Executive Order.

In addition to rulemakings, the draft water quality report contains recommendations for implementing a compliance and enforcement strategy focusing on four key sectors: concentrated animal feeding operations, stormwater discharges, wastewater treatment plants and air deposition sources of nitrogen regulated under the CAA, including power plants. Further, we will address pollutants from Superfund sites

and RCRA facilities that are impacting the Bay where we are performing removal, remedial and corrective action activities. EPA would also ensure that states adhere to their schedules for installing nutrient removal technology at significant wastewater treatment plants throughout the watershed; develop and promote model state septic tank control programs and ensure states meet their commitment to reduce septic tank loadings to the Bay; and pursue an ambitious regulatory agenda that would significantly reduce atmospheric deposition of nitrogen to the Bay.

EPA and USDA would also develop and implement a “Healthy Bay-Thriving Agriculture Initiative” that would include:

- An intensive and strategic effort to expand the use of key conservation practices in the high priority watersheds in the Bay
- Coordination with other federal and state partners on the development of next generation nutrient management planning tools;
- Establishment of centerpiece projects in each of the Bay states to demonstrate benefits of significant and innovative conservation approaches to addressing key issues in the region; and
- Implementation of a targeted, collaborative initiative using USDA and EPA funds to support development of critically needed tools and technologies that can create new market and revenue streams that support the adoption of conservation measures.

All of these recommendations are part of new leadership on the Bay. Working closely with our partner agencies, we will fulfill President Obama's goal to restore this unique ecological, economic, and cultural resource.

Key Challenge Reports and Coordinated Strategy

The other reports called for under Section 202 of the Order provide the lead agencies' recommendations to address the additional key challenges identified in the Order:

- Targeting conservation practices
- Strengthening storm water management at Federal facilities
- Adapting to impacts of a changing climate
- Conserving landscapes
- Strengthening science for decision making
- Conducting habitat and research activities to improve outcomes for living resources.

In the next 60 days, the Federal Leadership Committee will evaluate the recommendations and consult with states and the District of Columbia. The Committee will revise, refine, and prioritize the recommendations, and develop the best plan for meeting key challenges. Later this fall, the Federal Leadership Committee will release, for public comment, a draft strategy that integrates the seven reports. All of this will culminate in a final strategy targeted for release on May 12, 2010 – one year after the President issued the Executive Order.

Let me stress that this is not the beginning and the end of our work on the Chesapeake. We will not just be reviewing reports for the next eight months. Federal agencies are continuing to implement important actions for restoration and protection

and will continue to look for ways to move forward in implementing policies and programs before the strategy becomes final.

Chesapeake Bay Program Reauthorization

We applaud the Committee's leadership and look forward to offering you technical assistance to improve the performance and accountability of the Chesapeake Bay Program. EPA strongly supports reauthorization of the Chesapeake Bay Program and the opportunity to work with the Committee to make restoration and protection of the Bay happen more effectively and efficiently.

The Clean Water Act, Section 117, the Chesapeake Bay, was last authorized in 2000. It expired in 2005. This action by Congress was helpful in supporting the Chesapeake Bay Program and the Agreement adopted by the partners in 2000. But as we know now, the 2010 goals of that Agreement are not going to be achieved. Indeed, the goals of the original 1983 Agreement, which was the basis for the 1987 inclusion of Section 117, have not yet been achieved. We are hopeful that any reauthorization of the program will be supportive of and consistent with steps taken to date through our work to address the goals of the EO, and can put within our reach the goals of these agreements. This may necessitate significant changes to the program.

As noted earlier, the fundamental challenge for the Bay's water quality is reducing runoff pollution from urban, suburban and agricultural lands. In fact, urban

and suburban runoff pollution to the Chesapeake is increasing, while agricultural pollution is not declining nearly enough as needed to restore the Bay. Presently, we have a range of tools that we are implementing to tackle these problems, and through our work to address the goals of the EO we have found potential ways to increase the number and effectiveness of the tools available to us. However, as we continue to think about Bay restoration and protection, we are also examining changes to our program's authorization that may provide even better results.

Our nation's modern history includes several successful models of pollution control. The Clean Air Act (CAA), for example, has produced significant improvements in air quality, despite sizable growth in population, energy consumption, and vehicle miles travelled. As we think about ways to further protect the bay, we are looking at a range of accountability mechanisms including provisions similar to those available in the Clean Air Act.

We look forward to working with the Subcommittee and other Members of Congress to explore these issues in the months ahead. A reauthorization of the Chesapeake Bay Program presents all of us with a unique opportunity to redefine our future, and we greatly appreciate the Subcommittee's leadership in this regard.

Closing

Across the Chesapeake Bay watershed, there have been important actions over the past 25 years - by farmers to implement nutrient management practices and install buffer strips and fences; by homeowners to reduce energy consumption and runoff pollution; by localities to upgrade wastewater treatment plants and to reduce stormwater pollution; by developers to implement sediment and erosion control plans and implement smart growth practices; by states to expand land conservation and strengthen their water quality protection programs. However these good efforts are simply not sufficient.

The straightforward conclusion is that the Chesapeake Bay ecosystem remains severely degraded, despite the concerted efforts by many for more than 25 years. However, all of these challenging conclusions are tempered by a strong sense of optimism we all share for the future. Scientists have learned much about the Bay and that knowledge is being used by managers to help plan and evaluate new policies and practices. Our region's elected officials are engaged as never before. At EPA and partner federal agencies, we have clear direction from the President to provide the leadership necessary to protect and restore the Bay.

Thank you again Chairwoman Johnson, and Members of the Subcommittee, for the opportunity to appear before you today. In the coming months, we look forward to working with you on reauthorization amendments for the Chesapeake Bay Program that meet our shared goals for protecting and restoring this national treasure.



Memorandum

Updated 09/25/2009

To: Interested Parties

From: Ann Mills, Deputy Under Secretary
Natural Resources & Environment
U.S. Department of Agriculture

Re: Release of USDA Report on Chesapeake Bay Executive Order

Date: September 10, 2009

The Chesapeake Bay is a national treasure with great historical, cultural and economic significance.

USDA is committed to taking action to aggressively implement voluntary measures and market-based solutions in the Chesapeake Bay.

On May 12, President Obama issued Executive Order 13508 on Chesapeake Bay Restoration and Protection, the first-ever presidential directive on the Bay. The Executive Order called on the Federal Government to exercise greater leadership and Federal action to restore this great resource.

Today, USDA and other Federal agencies are providing insights into our earliest thinking about possible Federal actions to improve the health of the Bay. This is the beginning of a deliberate and transparent process.

In addition to an annual investment of \$90 million and additional \$188 million over five years for voluntary conservation programs under the 2008 Farm Bill, under Secretary Vilsack's leadership, USDA is going further by elevating water quality as an important national priority.

Through the 202(b) Report being made available today, USDA recommends a series of important new actions to improve Bay water quality including the following:

- USDA will invest financial resources in watersheds that have demonstrated the highest levels of nutrient loadings, primarily nitrogen and phosphorus. This represents a clear departure from past policy.
- USDA will work with Federal and State partners to focus on high impact practices that show the greatest water quality improvement per dollar invested.
- USDA will accelerate adoption of conservation practices by increasing incentives and coordinating outreach and marketing efforts in order to reach the most critical agricultural areas and generate interest in conservation practice implementation.
- USDA will use emerging markets for ecosystems services to promote new opportunities for actions

such as carbon sequestration, water quality, wetland protection, and habitat development.

- USDA will accelerate development of new conservation technologies through public-private research partnerships and by promoting innovation.
- USDA will implement a sound system of accountability by establishing environmental outcome measures, monitoring and assessing water quality, and using science to adapt the strategy.

As USDA takes these broad steps to improve the health of the Bay, the Department is very concerned about the loss of agriculture and forestry lands in the watershed.

- About 25% of the Chesapeake Bay Watershed produces a diverse array of fresh vegetables, fruits, grain, dairy, beef, poultry and other products. Agricultural lands also anchor rural communities and provide important open space, wildlife habitat and other benefits important to the fabric of this unique watershed.
- The Chesapeake Bay Watershed is currently losing 100 acres of forestland everyday. These forests prevent millions of pounds of nutrients and sediment from reaching the Bay each year.
- 130,000 new residents per year move into the Bay watershed. For every 8% increase in the population impervious surfaces (roads, parking lots etc.) increase by 41%.
- A one-acre parking lot produces about 16 times the volume of runoff that comes from a one-acre meadow.

Agriculture and Forestry are preferred land uses in the Bay watershed. While agriculture has been making positive reductions in nutrients and sediment to the Bay, urban and developed lands have increased pollution levels in recent years.

If you have any questions, contact the USDA press office at 202-720-4623.

To view the Executive Summary of USDA's report, go to [http://executiveorder.chesapeakebay.net/file.axd?file=2009%2f9%2f202\(b\)+Targeting+Resources+Draft+Report+Executive+Summary.pdf](http://executiveorder.chesapeakebay.net/file.axd?file=2009%2f9%2f202(b)+Targeting+Resources+Draft+Report+Executive+Summary.pdf)

To view the full report, go to [http://executiveorder.chesapeakebay.net/post/202\(b\)-Targeting-Resources-Draft-Report.aspx](http://executiveorder.chesapeakebay.net/post/202(b)-Targeting-Resources-Draft-Report.aspx)

To learn more about the President's Executive Order and the process for developing the Administration's recommendations for the Chesapeake Bay, go to <http://executiveorder.chesapeakebay.net>

NRDC Issue Paper
OCTOBER 2009

Seizing a Watershed Opportunity

NRDC's Plan to Clean Up the Chesapeake Bay and Its Beaches

Author

Janine Harris

Project Manager

Nancy Stoner



About NRDC

The Natural Resources Defense Council (NRDC) is an international nonprofit environmental organization with more than 1.3 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in New York City, Washington, D.C., Los Angeles, San Francisco, Chicago, Montana, and Beijing. Visit us at www.nrdc.org.

Acknowledgments

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Executive Summary

Following NRDC's annual nationwide beachwater quality report this summer, *Testing the Waters*, this issue paper zooms in on the Chesapeake Bay. On the heels of reports from seven federal agencies commissioned by President Obama to clean up this national treasure, this issue paper delves into the sources of pollution that are undermining the health of the Bay and provides the solutions that Congress must take up to bolster the important work being carried out by the other branches of government. From dangerous algal blooms, to harmful bacteria at our beaches, plastic bags clogging tributaries, and economic hardships for the crabbing industry, the Chesapeake watershed and those who rely on it are in need of help. By acting on our recommendations, Congress can enact the comprehensive policies needed to make a lasting difference in improving the health of the nation's largest estuary.

A Treasure Worth Protecting

The Chesapeake Bay is the largest estuary in the United States and the third largest estuary in the world. Considered a national treasure, the Bay drains an immense 64,000 square miles in six states: New York, Pennsylvania, West Virginia, Delaware, Maryland, and Virginia, as well as Washington, D.C. (Figure 1). Two of these states, Maryland and Virginia, have 83 beaches along the shoreline of the Bay that are analyzed in this paper.

The Chesapeake Bay watershed is not only large in landscape, but also in population. The population of the area is growing by more than 170,000 residents annually. Development within the watershed that is associated with this increasing population affects the local water resources that eventually reach the shoreline and beaches of the Chesapeake Bay. Between 1990 and 2000, the population in the Bay watershed increased 8 percent, while developed areas increased by a disproportionate 41 percent.¹

Measuring the Health of the Bay

The University of Maryland Center for Environmental Science and the National Oceanic and Atmospheric Administration (NOAA) create an annual Chesapeake Bay report card evaluating the health of the Bay. This comprehensive report card analyzes indicators of the Bay's health, such as chlorophyll a, aquatic grasses, dissolved oxygen, benthic organisms, water clarity, and phytoplankton.² The Bay received a grade of a C- in 2008. The Chesapeake Bay Foundation also rates the health of the Chesapeake Bay in the "State of the Bay Report," and assigned the Bay a low 28 points out of 100 in the 2008 report.³ In May 2009, President Obama expressed his concern about the health of the Chesapeake Bay in an Executive Order to the Environmental Protection Agency. In this Executive Order, President Obama established a Federal Leadership Committee for the Chesapeake Bay to coordinate protection and restoration efforts for the Bay. The President also asked the EPA to publish guidance for federal

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An Op-Ed Response — Chesapeake Bay Foundation: New stormwater rules won't increase costs

Editor's Note: The Chesapeake Bay Federation contacted Center Maryland and asked for an opportunity to respond to recent opinion pieces published on the state's proposed new stormwater regulations.

By Kim Coble

We interrupt the sky-is-falling rhetoric on the state's new stormwater regulations for a few facts.

The new rules will most likely reduce costs for many builders. The U.S. Environmental Protection Agency estimates 15-80 percent lower capital costs when builders use low-impact stormwater strategies similar to those required in the new state regulations. The agency arrived at those figures after evaluating 17 different case studies. Even in redevelopment settings, stormwater management does not have to raise costs, especially when several options are included as alternatives for meeting the state's requirement in the regulations as they currently exist.

It is incorrect to say these regulations will cause costs to go up. Everyone needs to keep this fact in mind when they hear unsubstantiated cost estimates for stormwater management quoted by builders – who are attempting to weaken the state's new rules through the legislative process.

An equally important fact: if builders don't properly treat stormwater from their development and redevelopment sites, taxpayers will have to pick up the tab of treating it as it heads into their local rivers. New federal initiatives will require states to reduce Bay pollution, and the fact is that if one group shirks its responsibilities, others will have to shoulder that debt.

The fact of the matter is that development has been dramatically changing our landscape for decades. Between 1990 and 2000 alone, our region's population grew by 8%, but the amount of land paved or covered with buildings and concrete increased by 41%. All those hard surfaces have created the stormwater pollution problem we face today. In fact, according to the Environmental Protection Agency Chesapeake Bay Program, urban and suburban development is the ONLY source of nutrient and sediment pollution that is increasing. There is no doubt that the development industry has profited from growth in Maryland, but there is also no doubt development has harmed local creeks, rivers and the Bay.

Some developers have tried to blame other types of pollution as culprits in the Bay's pollution, arguing that their own impact is minimal. Their logic: the amount of land paved over each year pales in comparison to the entire 64,000 square mile watershed. This is a specious argument and is not unlike trying to minimize the impact of agriculture over the years by only looking at the new farms that started production in one year alone.

Here are some other facts often overlooked in the rhetorical debate:

- Other jurisdictions, including Montgomery County and Philadelphia, have been meeting similar standards for stormwater management with no ill effects to builders or localities. Even in high density urban areas, higher standards of treatment have not created an exodus of development to the farm fields.
- All regulations require implementation flexibility; we stand firm with the development community in demanding clarity, flexibility, and attention to site-specific details especially in these first several months of implementation. But we should NOT and can NOT preempt regulatory improvements out of fear, or uncertainty.
- These new rules can help create jobs. These regulations follow a national trend – using “green infrastructure” technologies, instead of outdated structural practices. Requiring these practices in Maryland will boost employment of landscape architects, site designers, engineers and others.

The new rules benefit everyone – builders and the real estate industry, and everyone who is tired of stinky fish kills, endangered crab populations, and concrete dead zones stretching for miles over our landscape.

Legislators should not allow themselves to be scared by unsubstantiated predictions of doom. The Stormwater Management Act of 2007 they passed is the basis of these regulations, and reflects a necessary, yet modest improvement from the status quo. It is not a radical departure and in fact, was supported by the development community.

We must put the rhetoric aside and think about the dollars we will continue to hemorrhage in the Chesapeake region from decimated fisheries, lost tourism dollars, property flooding, sediment-clogged waterways, and the toll of continued finger-pointing for the Chesapeake's water quality shortcomings. Everyone, including the development community – needs to acknowledge their decades of free passes and step up to the plate to help correct the course.

Kim Coble is Maryland Executive Director of the Chesapeake Bay Foundation.

Here are opinion pieces on stormwater regulations previously published by Center Maryland:

[Builders: Are Jobs Really a Priority?](#)

[VIDEO: Jim Smith on stormwater regulations](#)

[A threat to Smart Growth](#)

This entry was posted on Friday, February 12th, 2010 at 2:38 am. You can follow any responses to this entry through the [RSS 2.0](#) feed. Both comments and pings are currently closed.

- [The Video Lottery Commission's Letter to the Governor](#)

Maryland's Video Lottery Commission is attracting some headlines for its recent recommendations to Governor Martin O'Malley and the General Assembly leadership on

Appendix B

Tables and Graphs Showing Impervious Area and Population Increases by Year
(1985-2008) in the Chesapeake Bay Watershed and the Portion of Each
Jurisdiction Within the Watershed

**Impervious Area and Population by Year (1985-2008)
in the Chesapeake Bay Watershed and the Portion of Each Jurisdiction Within the Watershed**

	Chesapeake Bay Watershed			Delaware			District of Columbia			Maryland			New York			Pennsylvania			Virginia			West Virginia		
	Population (# people)	Impervious Area (acres)																						
1985	13,357,678	635,050	127,808	6,822	634,549	17,422	4,382,729	194,981	27,341	671,951	27,341	3,294,454	181,207	4,077,577	200,236	168,609	7,040							
1986	13,535,553	644,765	130,060	7,048	638,269	17,456	4,456,369	198,181	27,443	670,339	27,443	3,307,306	183,243	4,163,162	204,189	170,050	7,205							
1987	13,743,105	654,481	132,161	7,274	636,930	17,489	4,534,707	201,381	27,546	671,639	27,546	3,325,935	185,280	4,269,056	208,142	172,678	7,370							
1988	13,958,515	664,197	134,104	7,500	630,432	17,522	4,626,693	204,580	27,648	676,613	27,648	3,352,266	187,316	4,362,165	212,095	176,242	7,535							
1989	14,128,263	673,912	136,220	7,726	624,168	17,555	4,695,621	207,780	27,750	681,678	27,750	3,374,660	189,353	4,436,414	216,048	179,460	7,701							
1990	14,250,226	683,628	138,211	7,952	606,900	17,588	4,748,709	210,960	27,852	684,310	27,852	3,395,524	191,390	4,494,087	220,001	182,486	7,866							
1991	14,429,413	693,344	141,701	8,178	593,239	17,621	4,823,271	214,179	27,954	687,103	27,954	3,428,656	193,426	4,568,811	223,954	186,632	8,031							
1992	14,574,362	703,060	144,098	8,404	584,183	17,654	4,869,117	217,379	28,057	689,042	28,057	3,449,538	195,463	4,648,802	227,906	189,583	8,196							
1993	14,698,459	712,775	146,656	8,630	576,358	17,687	4,908,589	220,579	28,159	688,741	28,159	3,472,137	197,499	4,713,426	231,859	192,551	8,362							
1994	14,808,418	722,491	148,850	8,856	564,982	17,721	4,951,060	223,778	28,261	686,037	28,261	3,489,857	199,536	4,772,257	235,812	195,375	8,527							
1995	14,895,221	732,207	151,371	9,082	551,273	17,754	4,988,862	226,978	28,363	679,494	28,363	3,501,256	201,572	4,825,099	239,765	197,865	8,692							
1996	14,981,360	741,922	153,741	9,308	538,273	17,787	5,021,982	230,178	28,465	673,709	28,465	3,510,707	203,609	4,882,656	243,718	200,292	8,858							
1997	15,070,311	751,638	155,829	9,534	528,752	17,820	5,057,299	233,377	28,568	668,454	28,568	3,512,574	205,646	4,944,514	247,671	202,890	9,023							
1998	15,157,174	761,354	158,390	9,760	521,426	17,853	5,094,291	236,577	28,670	665,535	28,670	3,514,618	207,682	4,996,856	251,624	206,057	9,188							
1999	15,277,482	771,070	160,945	9,986	519,000	17,886	5,135,416	239,777	28,772	663,106	28,772	3,518,532	209,719	5,071,143	255,577	209,339	9,353							
2000	15,715,448	780,785	170,282	10,212	512,059	17,919	5,258,913	242,976	28,874	669,549	28,874	3,579,049	211,755	5,250,248	259,530	215,348	9,519							
2001	15,935,573	790,501	173,646	10,438	513,822	17,952	5,348,073	246,176	28,976	669,436	28,976	3,588,659	213,792	5,361,908	263,482	220,029	9,684							
2002	16,114,588	800,217	176,511	10,664	510,898	17,986	5,419,700	249,376	29,079	670,644	29,079	3,601,143	215,829	5,451,178	267,435	224,514	9,849							
2003	16,221,773	813,326	180,087	11,024	510,803	18,153	5,432,852	253,275	29,221	667,704	29,221	3,624,101	218,459	5,517,868	273,148	228,358	10,046							
2004	16,401,706	826,436	183,256	11,384	519,621	18,320	5,499,060	257,175	29,364	665,175	29,364	3,624,493	221,090	5,615,131	278,860	234,971	10,243							
2005	16,550,533	839,545	187,329	11,745	524,049	18,487	5,534,637	261,074	29,506	661,874	29,506	3,641,600	223,720	5,701,990	284,573	241,053	10,440							
2006	16,716,069	852,655	191,273	12,105	521,530	18,654	5,577,013	264,973	29,649	664,545	29,649	3,677,337	226,351	5,774,945	290,286	249,425	10,637							
2007	16,806,038	865,765	195,031	12,465	528,292	18,822	5,579,592	268,873	29,791	660,143	29,791	3,687,833	228,981	5,843,005	295,998	252,141	10,835							
2008	16,893,805	878,874	198,030	12,825	521,833	18,989	5,594,830	272,772	29,934	657,532	29,934	3,700,155	231,612	5,896,133	301,711	255,293	11,032							

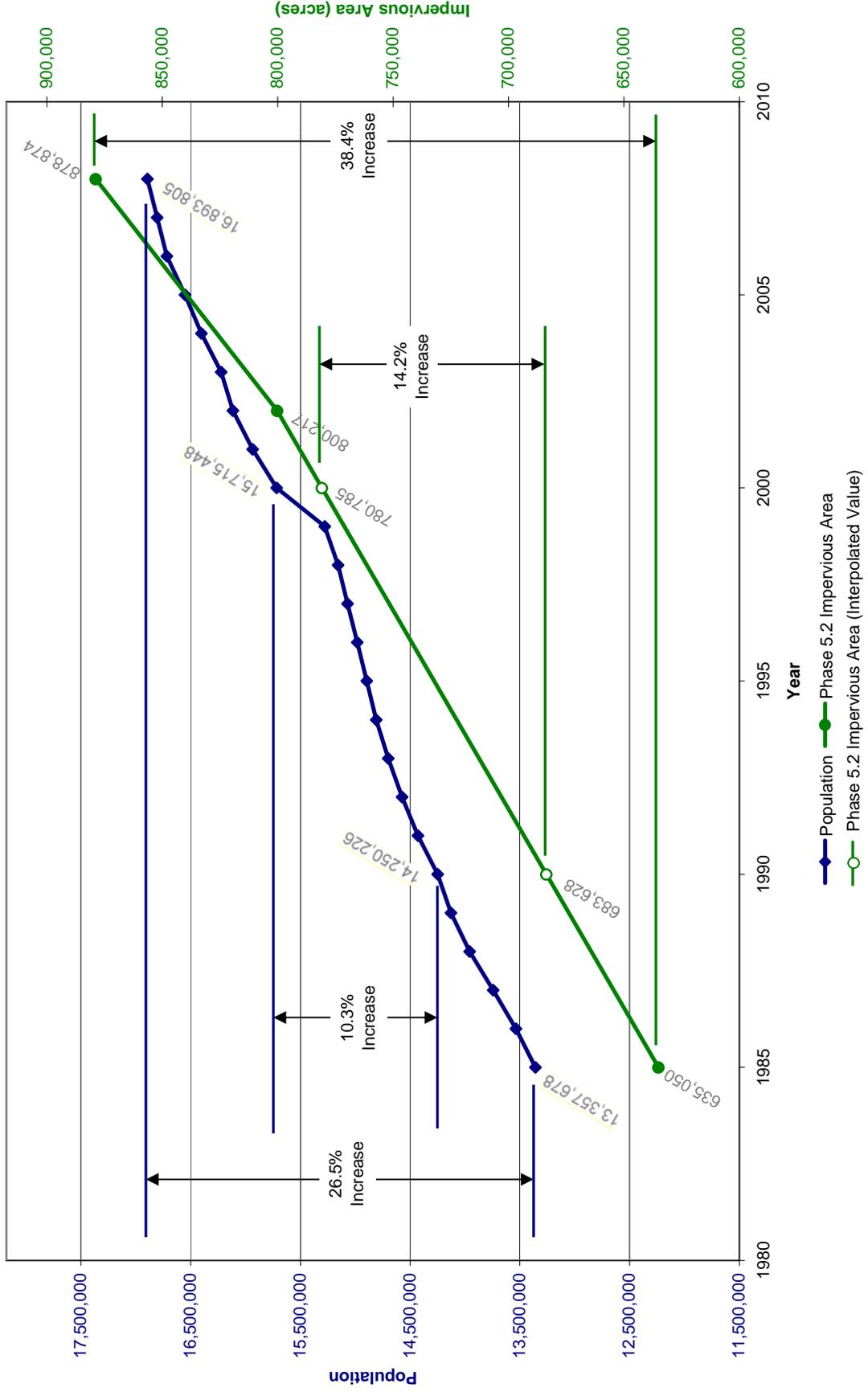
Legend:

Indicates Values from U.S. Census

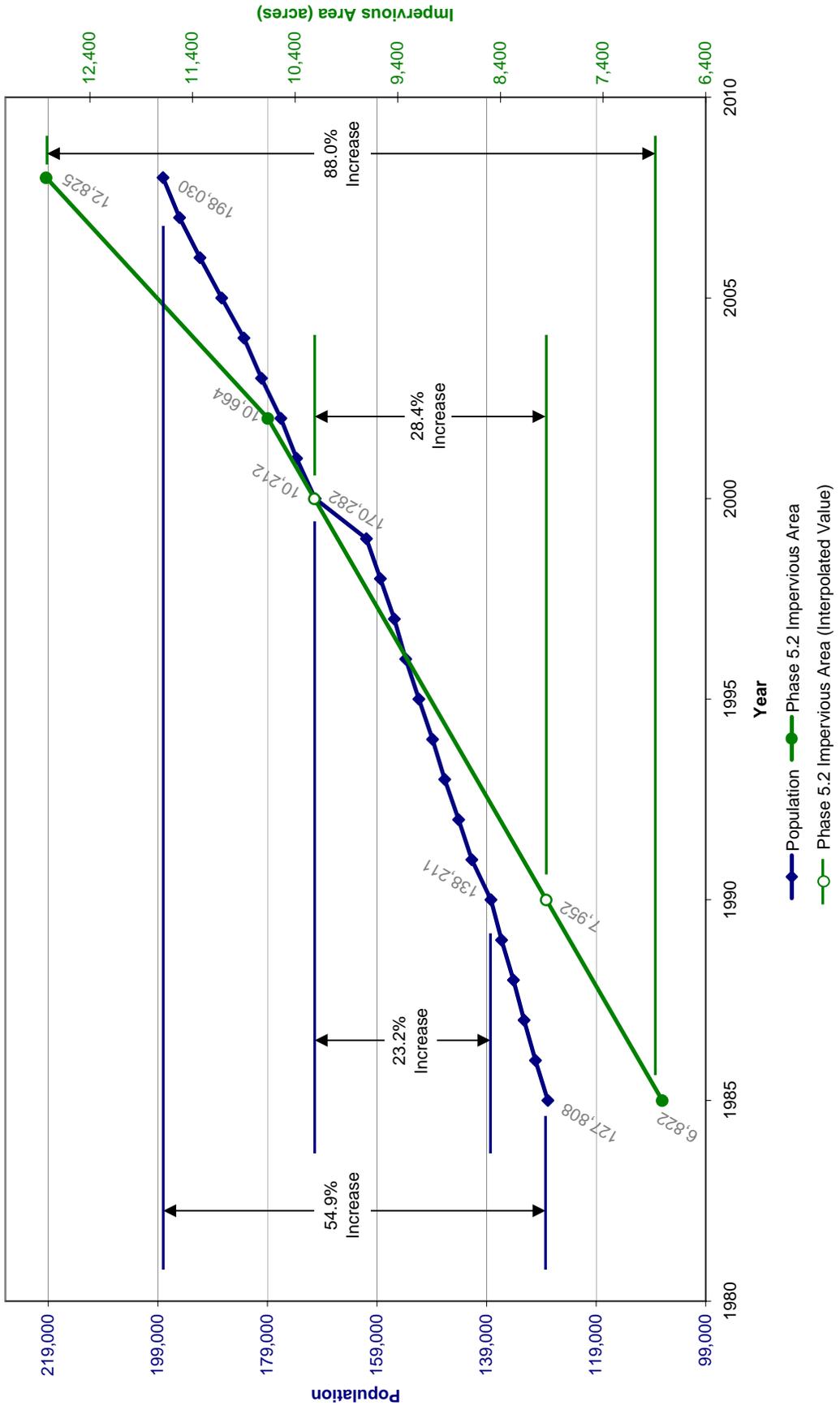
Indicates Values from Phase 5.2 Chesapeake Bay Community Watershed Model

Indicates Interpolated Values (based on Phase 5.2 model data)

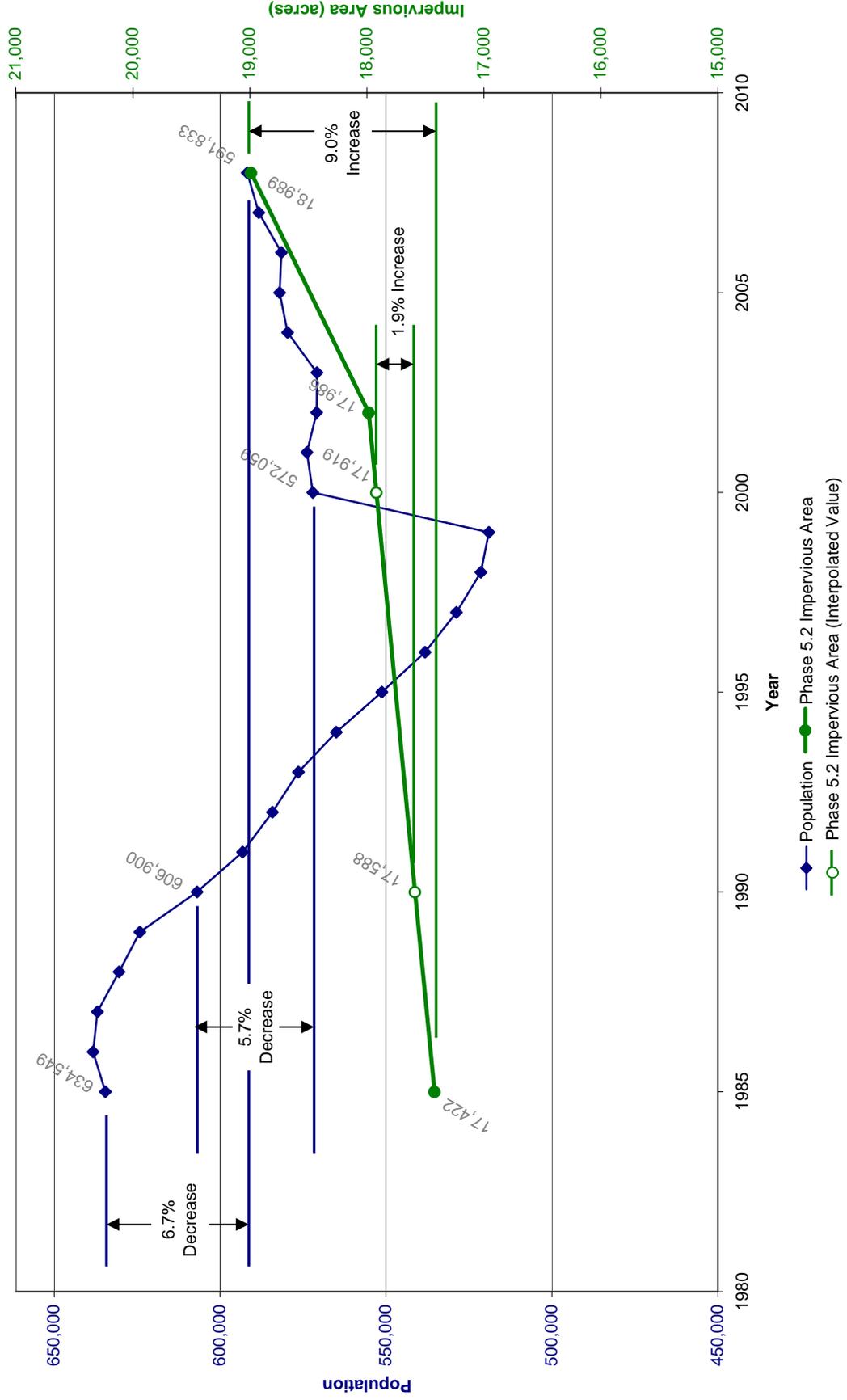
Chesapeake Bay Watershed Impervious Area and Population Increases by Year (1985-2008)



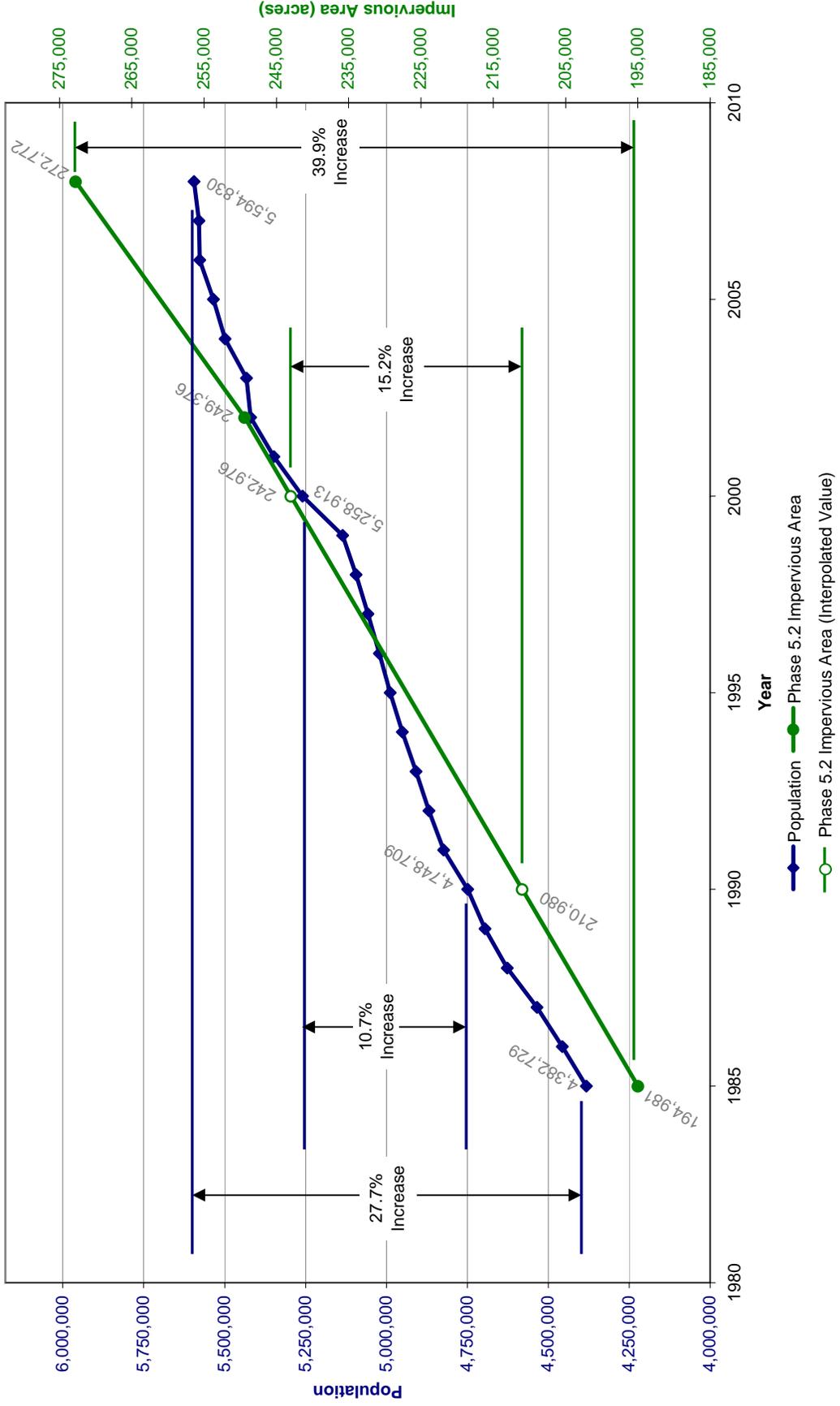
Impervious Area and Population Increases by Year (1985-2008) in the Chesapeake Bay Watershed Portion of Delaware



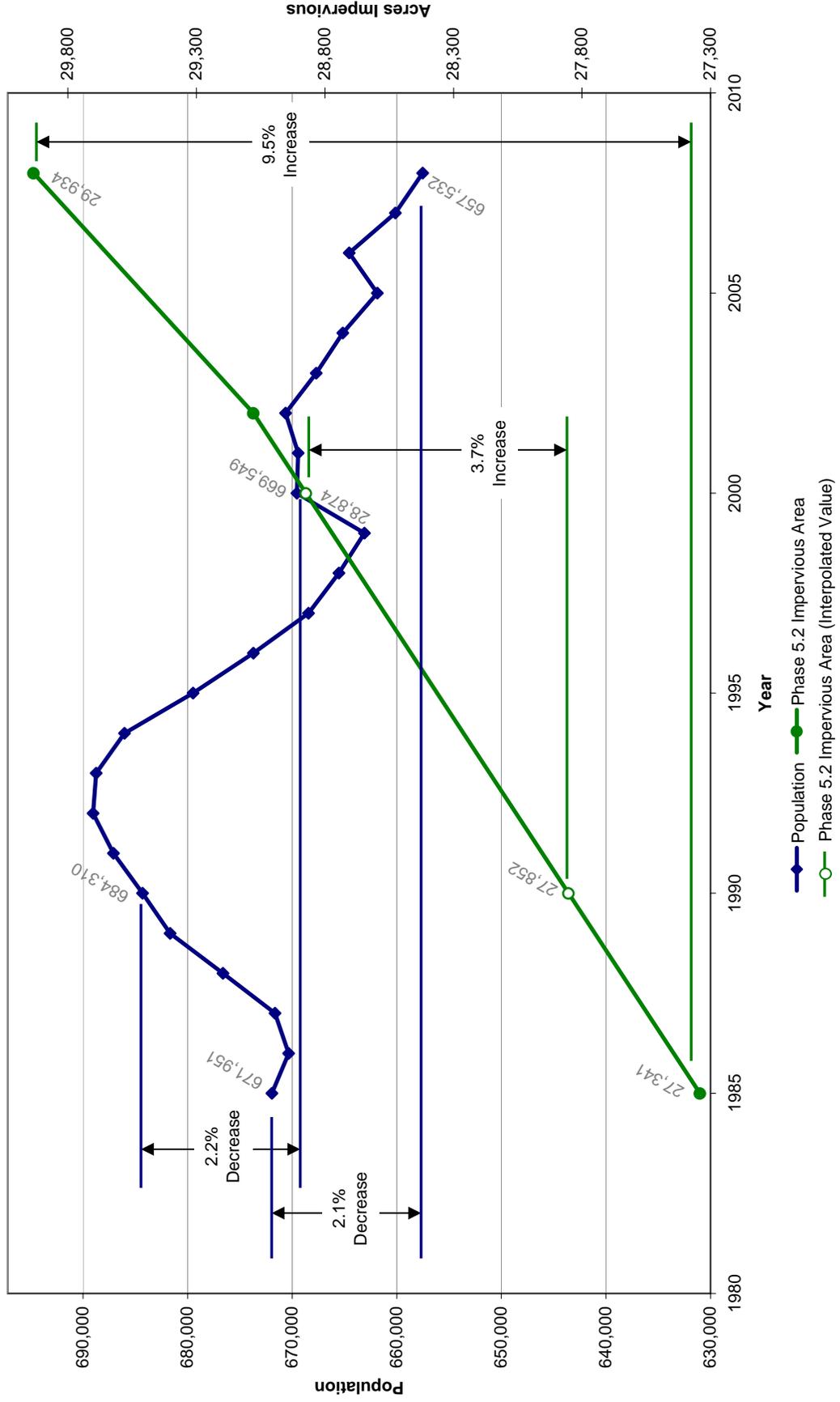
Impervious Area and Population Increases by Year (1985-2008) in the District of Columbia



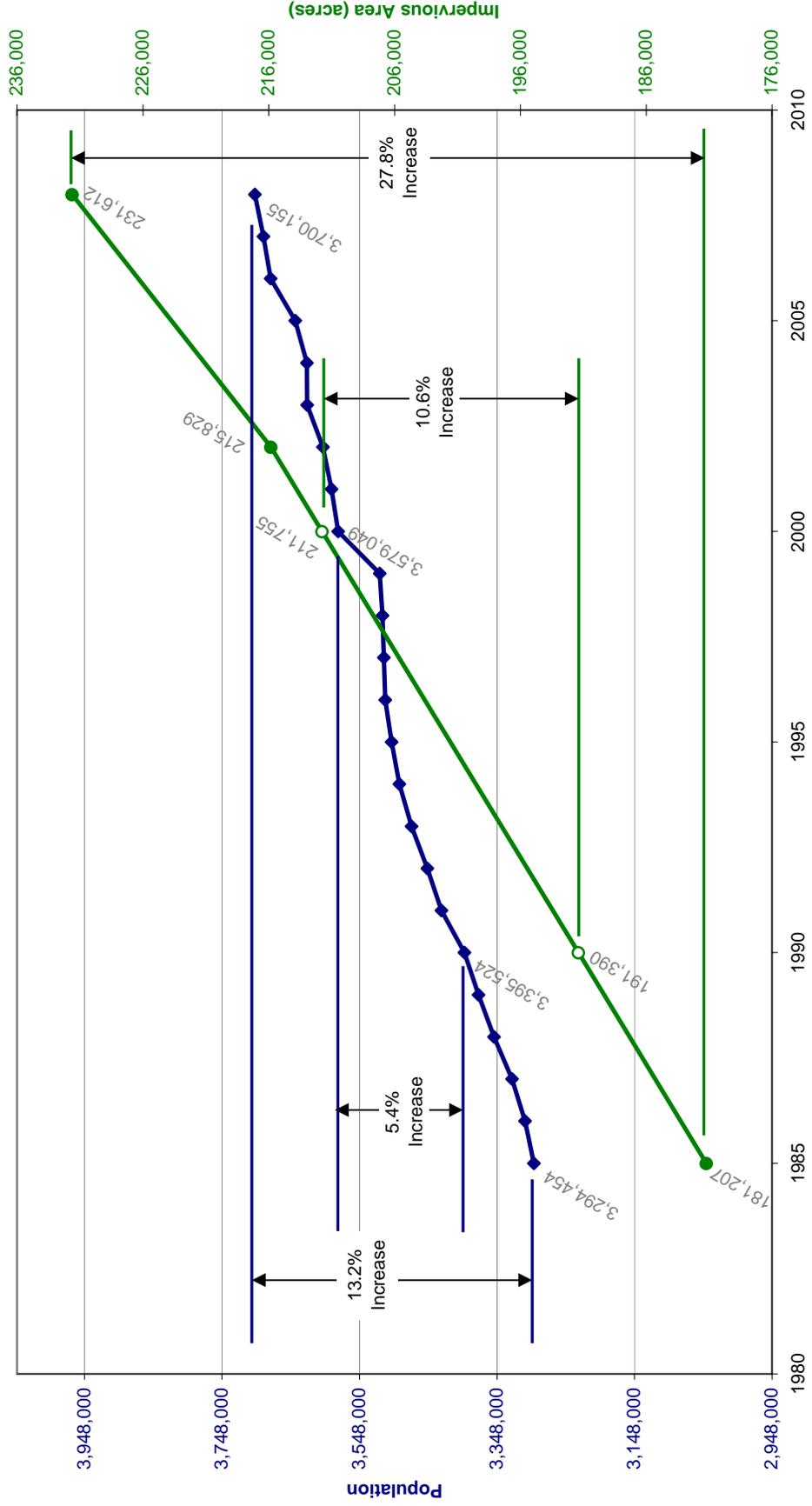
Impervious Area and Population Increases by Year (1985-2008) in the Chesapeake Bay Watershed Portion of Maryland



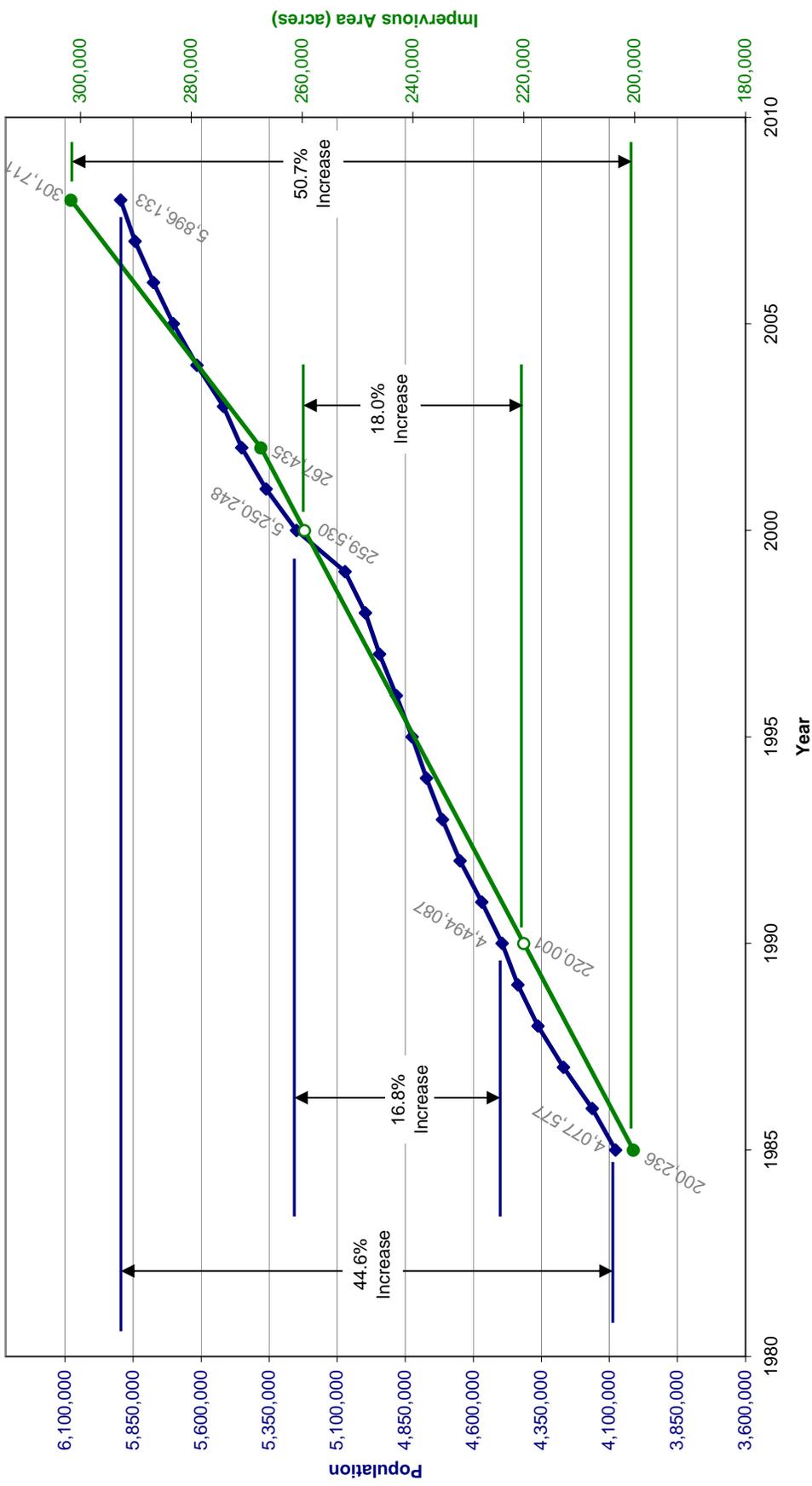
Impervious Area and Population Increases by Year (1985-2008) in the Chesapeake Bay Watershed Portion of New York



Impervious Area and Population Increases by Year (1985-2008) in the Chesapeake Bay Watershed Portion of Pennsylvania



Impervious Area and Population Increases by Year (1985-2008) in the Chesapeake Bay Watershed Portion of Virginia



Impervious Area and Population Increases by Year (1985-2008) in the Chesapeake Bay Watershed Portion of West Virginia

