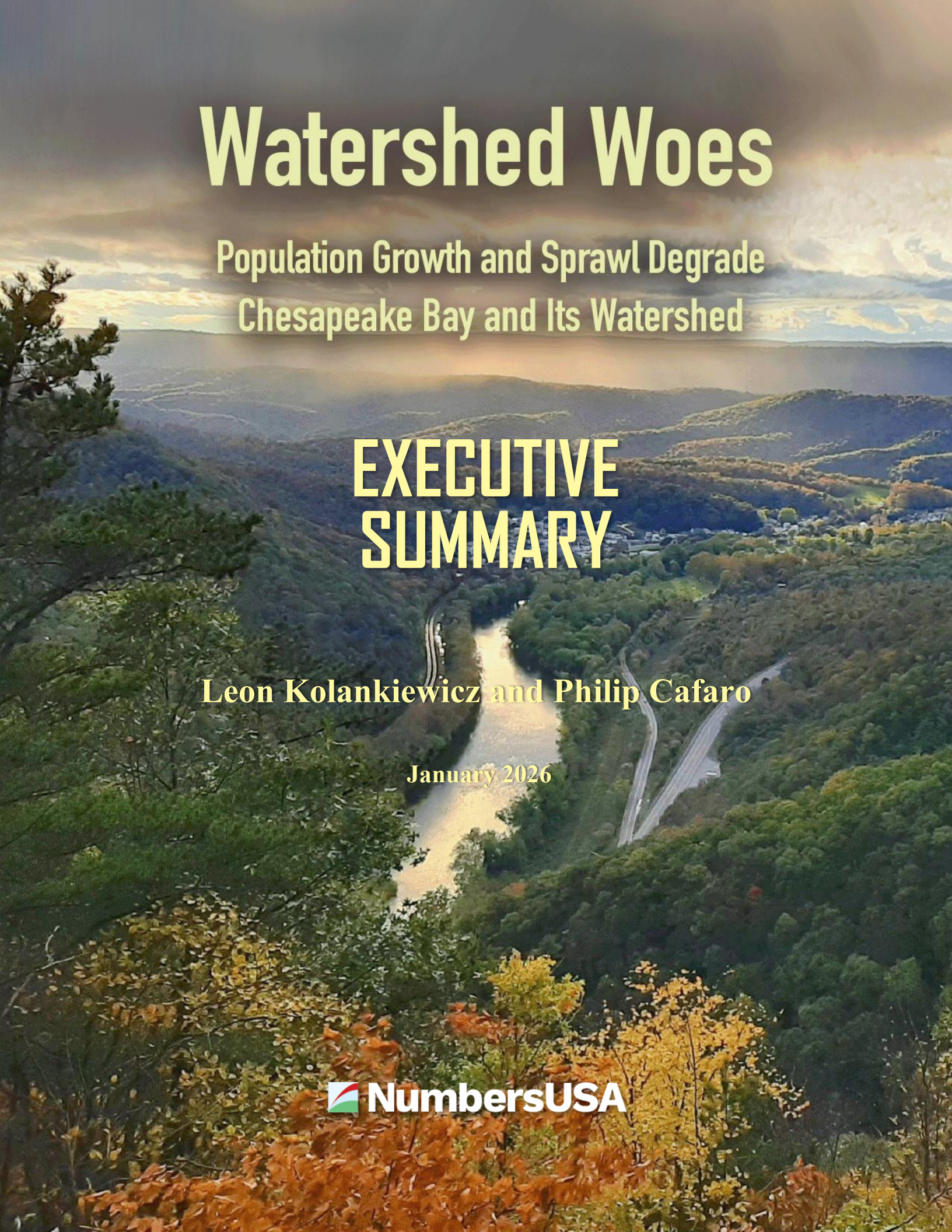

Watershed Woes

Population Growth and Sprawl Degrade Chesapeake Bay and Its Watershed

EXECUTIVE SUMMARY

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NumbersUSA

An Ecosystem at Risk

As the third largest estuary on Earth, the Chesapeake Bay is an essential nursery for global marine life, a key feeding stop on the Atlantic migratory bird flyway and a priceless resource for residents and visitors alike. **Between 1982 to 2017, new development eliminated more than 5,000 square miles of natural and agricultural lands in the Chesapeake Bay's watershed** (Figure ES-1) — losses equal to twice the state of Delaware. Our analysis of the most recent federal data finds that most of this rural land conversion was caused by rapid population growth — a nearly six million increase during the study period — and most population growth was driven by immigration into the region.

Figure ES-1. Boundary of the Chesapeake Bay Watershed, encompassing 41 million acres (64,000 square miles) spread across six states

Sprawling development within the Chesapeake Bay watershed (CBW) has led to significant habitat loss and reduced numbers for many species over the past four decades (Figure ES-2). It has increased air and water pollution across the region. By reducing access to nature and increasing commute times and housing costs, sprawl has reduced residents' quality of life. It has also degraded the health of the Bay in numerous ways.

Figure ES-2. Sprawl proliferating across the Chesapeake Bay Watershed landscape

An estimated 5.2 million tons of sediment are dumped into the Bay annually, clouding the water and interfering with photosynthesis of vegetation at the base of aquatic food webs. Runoff from expanding urban and suburban landscapes fills the Bay with road salts, crankcase oil, household chemicals, microplastics, herbicides and insecticides. Productive aquatic habitats have been degraded, resulting in fish kills and large "dead zones." **To restore the Bay and the CBW as a whole to ecological health, sprawl must be reined in.**

The CBW has seen many land use changes over the past forty years, including conversion of dirt and two-lane roads to paved multi-lane highways, the creation of new suburbs and towns, and recently the proliferation of data centers and their associated utility infrastructures. But the most consequential change, according to our study, has been a massive increase in the regional population (Figure ES-3).

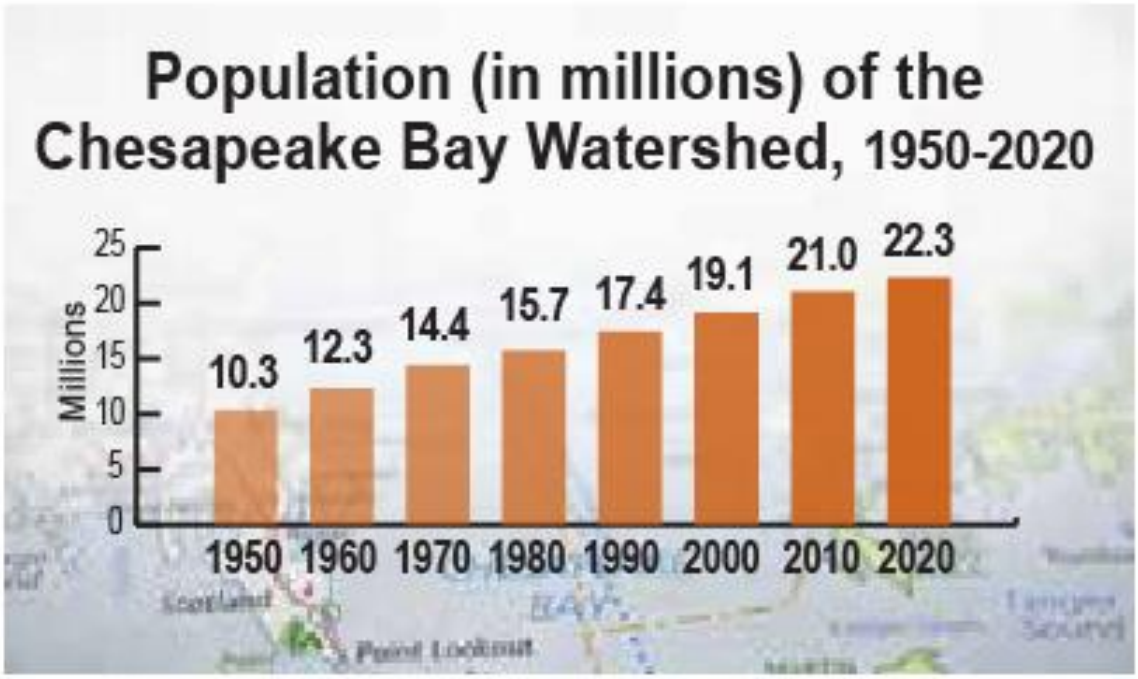

Figure ES-3. Population Growth in the Chesapeake Bay Watershed Counties from 1950 to 2020

Our study quantifies the loss of rural lands (both natural and agricultural areas) to urban and suburban development in the CBW's 191 counties and independent municipalities in six states: Virginia, Maryland, Delaware, West Virginia, Pennsylvania and New York. It analyzes the relative importance of the two main drivers of rural land loss: population growth and growth in per capita land use. It projects future sprawl rates for the CBW based on a range of immigration levels and associated population growth rates. And it considers the likely ecological impacts of different population policies going forward.

Key Findings

- **Sprawl is devouring rural land in the CBW at a rapid and unacceptable rate**

Between 1982 and 2017, according to the most recent data from the National Resources Conservation Service, 3,228,600 acres (5,045 square miles) of natural and agricultural land were converted to developed uses in the CBW. 84 percent of all sprawl in the CBW occurred in three of the six watershed states: Virginia (36%), Pennsylvania (31%), and Maryland (17%) (Table ES-1).

Table ES-1. Amount and Sources of Sprawl in CBW Watershed Counties and Municipalities, 1982-2017

State	Total Sprawl 1982 to 2017 (acres)	% of Sprawl Related to Population Growth	% of Sprawl Related to Growth in Per Capita Developed Land Use
Delaware	**138,700**	**85%**	**15%**
Maryland	**561,300**	**80%**	**20%**
New York	**291,100**	**7%**	**93%**
Pennsylvania	**948,800**	**34%**	**66%**
Virginia	**1,163,000**	**76%**	**24%**
West Virginia	**125,700**	**60%**	**40%**
Total Sprawl	**3,228,600**	**58%**	**42%**

The area of developed land in the CBW increased by 71% during our study period. Although official figures are not yet available for the eight years since 2017, it appears development has continued apace in the region.

- **Population growth is the main driver of sprawl in the watershed**

For this study, we compared changes in per capita land use, which are influenced by multiple factors, with the single factor of **population**, which **increased by 5.9 million in the CBW during this period**. Analysis of recent data finds that **58% of rural land conversion was caused by population growth, with 42% caused by increased per person land use** (Table ES-1 and Figure ES-4). Both factors thus appear to be important in driving overall sprawl.

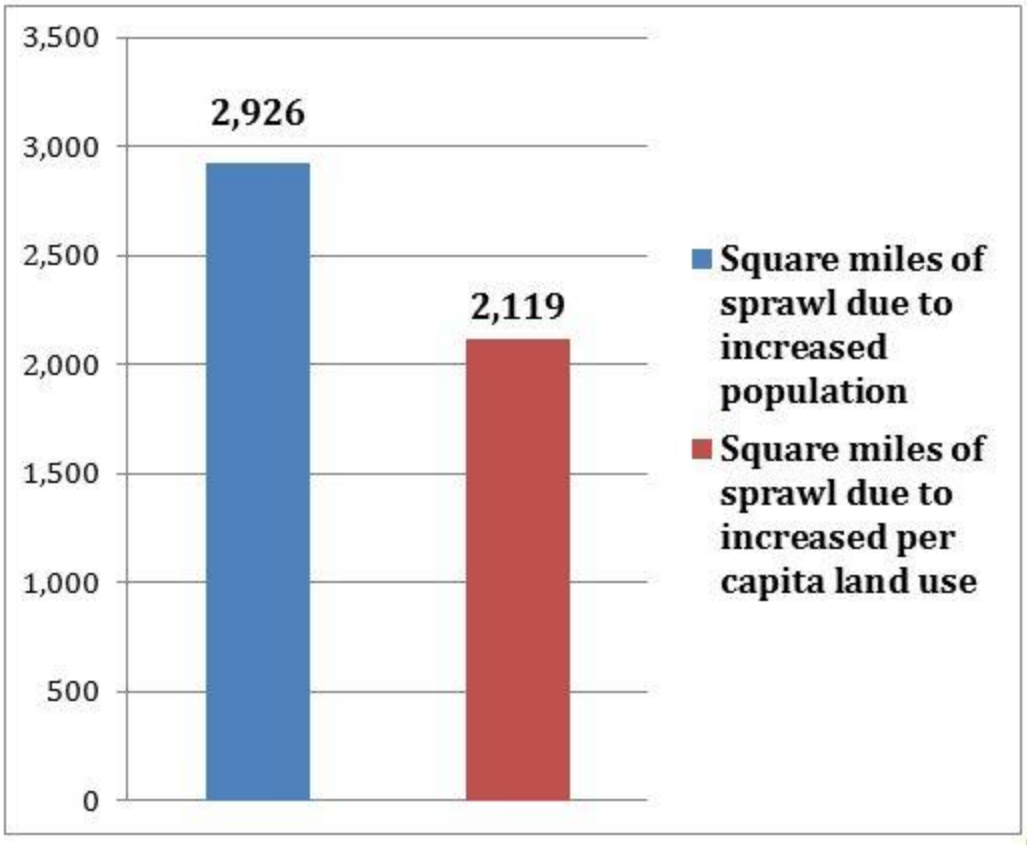

Figure ES-4. Rural Land Lost to Population Growth vs. Rural Land Lost to Increased Per Capita Land Use in CBW Counties, 1982-2017

The six watershed states varied considerably in the relative share of sprawl attributable to our two factors (Table ES-1). In New York, population growth's contribution to sprawl in the Chesapeake Bay watershed was negligible, while in Pennsylvania it accounted for one-third of all sprawl, with increased per capita land use accounting for the other two-thirds. In the other four states population growth was the leading sprawl factor, accounting for three-quarters or more of all sprawl in Virginia, Maryland and Delaware and a solid sixty percent in West Virginia.

In a more recent 15-year subset of the study period, 2002-2017, we found population growth accounted for 71% of the 742,400 acres (1,160 square miles) of sprawl in the total watershed, while growth in per capita developed land use caused only 29%. Thus population growth's role as a driver of sprawl in the watershed appears to have become more pronounced over time.

- **In the future, the scale of rural lands lost to development in the CBW will depend primarily on whether the region's population continues to grow**

Per capita land use has been increasing in the Chesapeake Bay watershed over the past four decades. Optimistically assuming the same rate of per capita land use that existed in 2017 (0.36 acre/person) for the rest of this century, Figure ES-5 shows the implications for rural land loss in the CBW by 2100 under three plausible population scenarios.

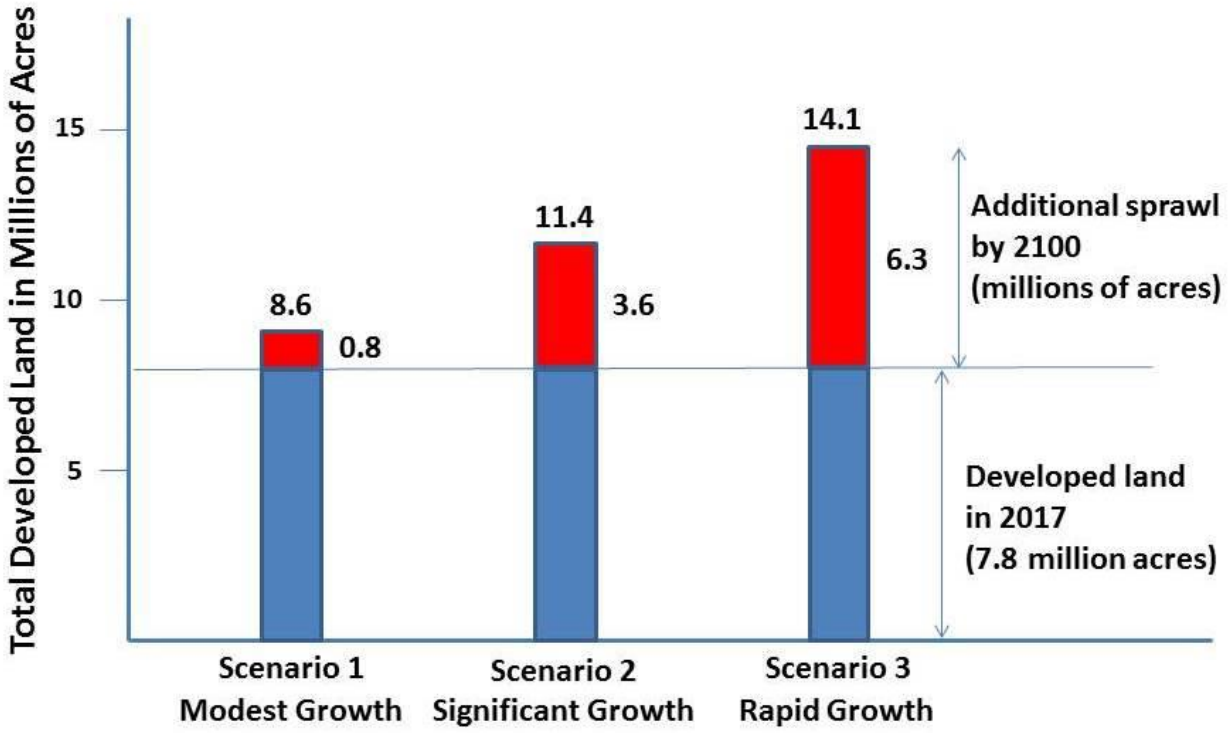

Figure ES-5. CBW Sprawl Projections to 2100 under Modest, Significant and Rapid Population Growth Scenarios

Under Scenario 1 with modest population growth, total developed land would increase from approximately 7.8 million acres to 8.6 million acres in the CBW (a 10% increase). Under Scenario 2 with significant population growth, developed land would increase to 11.4 million acres (a 46% increase). Under Scenario 3 with rapid population growth, developed land would sprawl to 14.1 million acres (an 81% increase), or 6.3 million more acres lost to development.

Any changes in per capita land use, up or down, will also influence future sprawl rates. But with population growth driving 71% of sprawl in the most recent period analyzed, population trends seem set to largely determine whether sprawl continues to displace agriculture and native species in the CBW.

- **In the future, whether the CBW's population grows or stabilizes will largely be determined by federal immigration levels**

During our study period, the population of the CBW increased at essentially the same rate as the U.S. as a whole (38% and 40% respectively) and we assume that in the future these populations will continue to move roughly in tandem. With U.S. fertility rates projected to remain well below replacement level, future population growth in the CBW will primarily be a function of future immigration levels. Figure ES-6 depicts projected population growth in the CBW under three plausible scenarios of annual net national immigration: one million, two million and three million. All three scenarios hold fertility rates steady and gradually increase longevity.

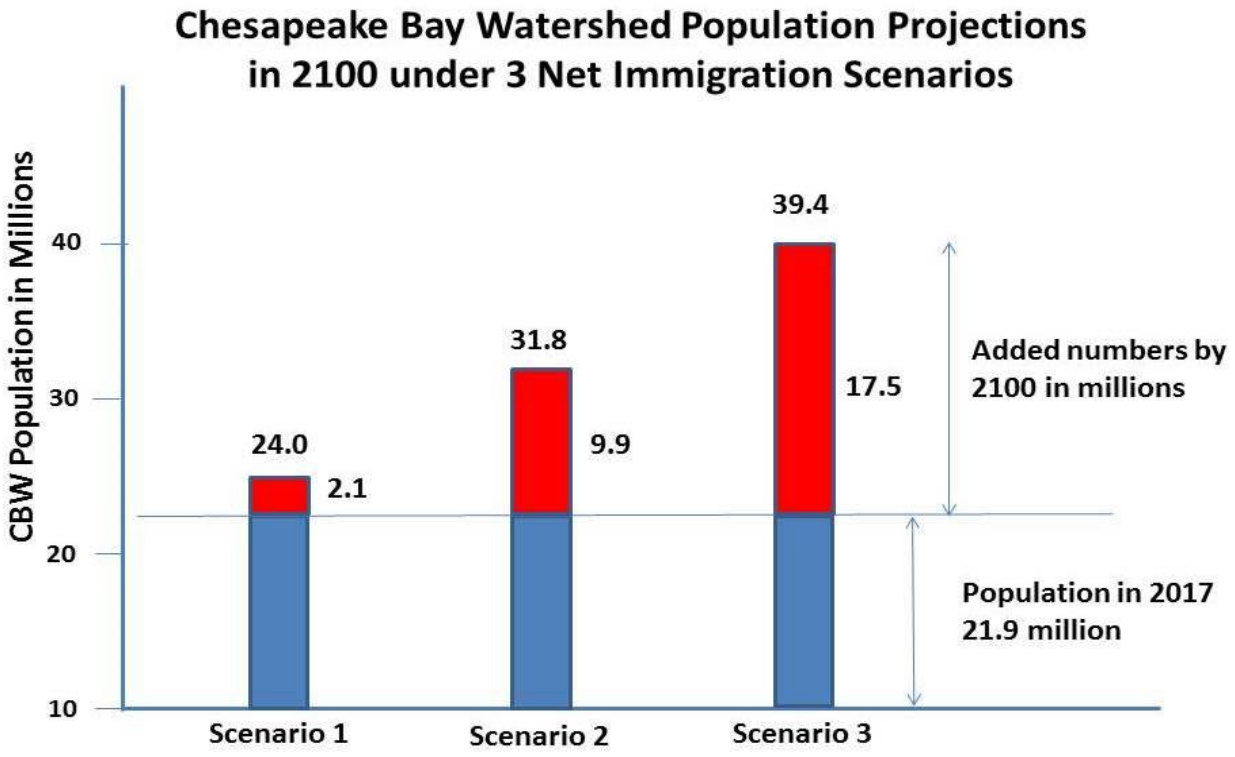

Figure ES-6. CBW Population Projections to 2100 under Three Different Net Immigration Scenarios: one, two and three million annual net migration into the U.S. as a whole

At one million annual net migration nationwide, the CBW population would increase by 2.1 million to 24.0 million by 2100, or an increase of 10%. At two million annual net migration, population increases by 9.9 million to 31.8 million, or an increase of 45%. And at three million annual net migration, the CBW population would increase by 17.5 million to 39.4 million, or an increase of 80%.

Clearly, U.S. immigration numbers will have an enormous effect on the number of residents in the CBW in the future – each one a consumer of resources generating pressure to use and develop rural land.

Policy Implications

As a wise person once said, "an estuary provides a report card on its watershed." **A recent report from the Chesapeake Bay Foundation confirmed that the six watershed states are failing to protect the CBW or restore the Bay to health**. This new report card gave area governments a C for protecting wetlands, a D for phosphorus pollution in the Bay and an F for water clarity and preserving the region's oysters and shad. In response, the report's authors advocate better land use planning, tightened pollution controls and efforts to restore degraded lands. All these efforts are necessary. But so is ending sprawl: the continued loss of agricultural and wild lands to new development. And the reality is that going forward, whether the population continues to grow and devour land in the CBW and degrade water quality in Chesapeake Bay will largely be determined by federal immigration policy.

As we have seen, sprawl in the CBW is driven primarily by population growth. State and local **"smart growth" efforts can reduce sprawl somewhat through good planning, zoning and transportation policies. But such efforts are bound to be swamped if the U.S. population continues to increase** by many millions every decade, with significant numbers of these additional residents seeking a home within the Chesapeake Bay watershed.

Because continued population growth in the CBW and the U.S. as a whole is now driven by immigration, **the solution to sprawl must include immigration reduction**. Our current path is unsustainable. Immigration levels must be reduced to halt the population growth and land conversion that are driving biodiversity losses in the CBW and degrading Chesapeake Bay's water quality, commercial fisheries and ecological health. **A healthy and vibrant Chesapeake Bay is within reach** (Figure ES-7) — **but only if we have the courage to address our own numbers**.

Watershed Residents Speak

The good news is that **the region's residents support strong action to rein in sprawl**. In conjunction with this study, NumbersUSA commissioned a poll from Rasmussen Reports of 1030 likely voters from across the CBW. The full results of this randomized, controlled survey are presented as Appendix I of this study.

Of note, **80 percent or more of poll respondents were concerned about sprawl and rapid population growth in the Chesapeake Bay watershed** (questions 1 and 2) **and more than 90 percent of respondents believe it is important to protect the remaining farmland, forests, wetlands and open spaces within the CBW from development** (question 6)**. Three quarters of respondents believe recent population growth in the Chesapeake Bay region has been too rapid and should be slowed** (question 11)**, while a majority believe the federal government should reduce immigration as part of doing so** (question 12)**.**

The science is clear. The people have spoken. Will the politicians listen — and act?

Figure ES-7. Salt marsh in Dorchester County, Maryland. The Transquaking River discharges into Fishing Bay near Blackwater National Wildlife Refuge.
Photo credit: Will Parson/Chesapeake Bay Program

For two and a half decades, NumbersUSA has been the leading organization researching the causes and solutions to sprawl and habitat loss in the United States. Recent studies include:

Greater Yellowstone – An Ecosystem at Risk (2024)

NEVADA No. 1 Sprawl (2024)

North Carolina Love Hurts (2024)

Illusion of Endless Texas Habitat (2023)

Disappearing Colorado (2022)

A Thirsty Arizona (2021)

Our most recent national study is **From Sea To Sprawling Sea (2022)**

All our studies can be found on our **sprawl study page**. To learn what you can do to fight population growth and sprawl, visit our **website**.

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