Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration

Mallows Bay-Potomac River Proposed National Marine Sanctuary Study Area Profile of Alternatives 2000 to 2015

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Mallows Bay Potomac River. Credit: Maryland Department of Natural Resources

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Abstract

This report will support the designation process for the proposed National Marine Sanctuary in Mallows Bay Potomac River. A study area profile includes a characterization of the area where the social and economic impacts of resource use take place and an overview of what is currently known about the uses of the natural and cultural resources that exist within the study area. For this application, there are three alternatives being considered and one is sanctuary management's preferred alternative. The preferred alternative, Alternative C, includes the primary counties of Charles County, MD, Stafford County, Prince William County and King George County, VA. The secondary counties and cities being analyzed are the District of Columbia, Prince George's County, MD, Fairfax County, Fredericksburg City, Arlington County, Loudoun County, Alexandria City, Fairfax City, and Manassas City, VA. The other alternatives also referred to as study area B and D are also included in the analysis. Study areas consider where the economic and social impacts take place. This report looks at the population measurements, demographic profiles and economic profiles of each study area in comparison to the state of Maryland, Virginia and the U.S. Both Maryland and Virginia are included in the report for comparison purposes due to the location of Mallows Bay Potomac River being adjacent to both states' shorelines. For the overview of the uses of the natural and cultural resources within each study area, information was obtained from the states' outdoor recreation plans. Although county and study area specific information was not available for recreation and tourist use of the natural and cultural resources of the study areas, information was obtained from a state-wide study that contains estimates of participation by recreation activity and the trends in those activities. This will aid future researchers in filling gaps in information for the study areas.

Key Words

Mallows Bay, Potomac River, Sanctuary, Population, Population Density, Population Growth, Population Density, Per Capita Income, Unemployment, Unemployment Rate, Gender, Race/Ethnicity, Age, Labor Force, Personal Income, Employment, Proprietors Income, Proprietors Employment, Personal Income, Personal Income by Industry, Employment by Industry, Economic impact of tourism, state recreation areas, beaches, maritime attractions.

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Figure/Table Number and Title Page

1. Introduction

Purpose

This report will support the designation process of the proposed National Marine Sanctuary, Mallows Bay-Potomac River, along the coasts of Virginia and Maryland. A study area profile reviews what is known about the area where the sanctuary is proposed. Information analyzed includes demographics, economic sectors and what is known about the recreational and commercial uses of the proposed sanctuaries. For this proposed sanctuary, there are three alternatives being considered in addition to the status quo or do nothing alternative. All three alternatives must be assessed in the Environmental Impact Statement (EIS), Regulatory Impact Review (RIR) and Regulatory Flexibility Analysis (impacts on small entities – primarily small businesses) of proposed regulations. Therefore, the characterization of the three proposed alternatives will be presented in this report. The study area profile serves as the "Description of Affected Environment – Socioeconomics" in the DEIS.

Study Area Definitions

Study Areas are composed of primary and secondary counties. Primary counties are along the shoreline or directly adjacent to the sanctuary boundary where the primary social and economic impacts take places as a result of using the cultural and natural resources located within the sanctuary.

Secondary counties are counties where a significant portion of economic impact takes place via the multiplier effects of spending in primary counties. These counties are determined by reviewing the Census of Inter-county Commuters at the U.S. Census Bureau. This file shows for each county where people work and the county (ies) where they live. The objective is to account as fully as practical the amount of "local" economic activity that is associated with spending related to the use of the cultural and natural resources. We use a threshold of around 5,000 workers to reach a significant level to include a county as a secondary county.

The table below presents the three alternative study areas. Proceeding the table are three figures that present Alternatives B, C and D with their respective study areas. The primary and secondary counties are indicated on the maps. Alternative C is the preferred alternative. There are seven counties in the study area for Alternative B, thirteen counties and special district cities (i.e., treated like counties for federal information) in the study area for Alternative C and 15 counties and special district cities in the study area for Alternative D.

Table 1.1 Study Areas for Each Alternative

County/City	Alternative B	Alternative C	Alternative D
Charles County, MD	Primary	Primary	Primary
Stafford County, VA	Primary	Primary	Primary
Prince William County, VA	Secondary	Primary	Primary
King George's County, VA		Primary	Primary
Fairfax County, VA	Secondary	Secondary	Secondary
District of Columbia	Secondary	Secondary	Secondary
Prince George's County, MD	Secondary	Secondary	Secondary
Montgomery County, MD			Secondary
Fredericksburg City, VA	Secondary	Secondary	Secondary
Arlington County, VA		Secondary	Secondary
Loudoun County, VA		Secondary	Secondary
Alexandria City, VA		Secondary	Secondary
Fairfax City, VA		Secondary	Secondary
Manassas City, VA		Secondary	Secondary
Fall's Church City, VA			Secondary

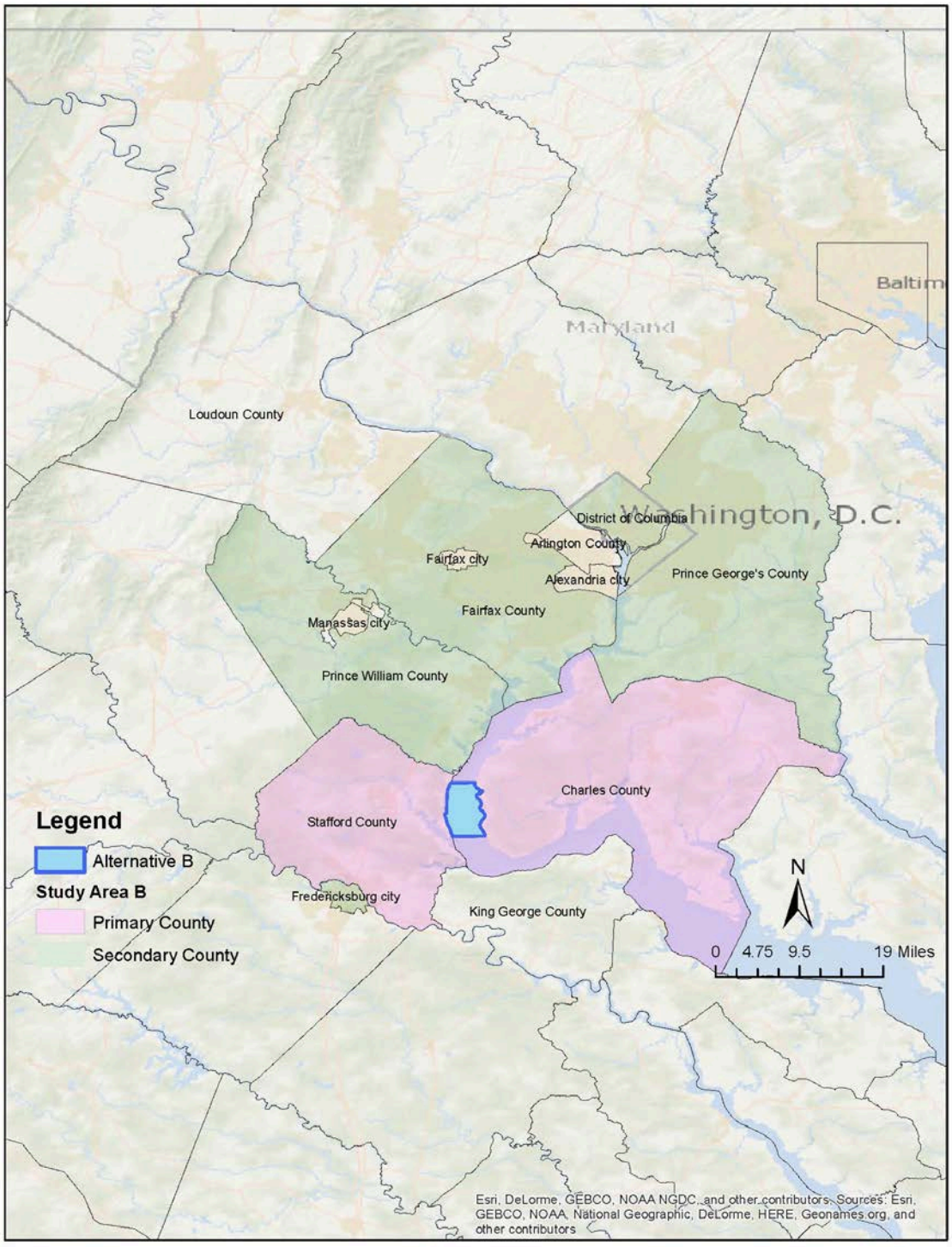


Figure 1.1 Alternative B Study Area

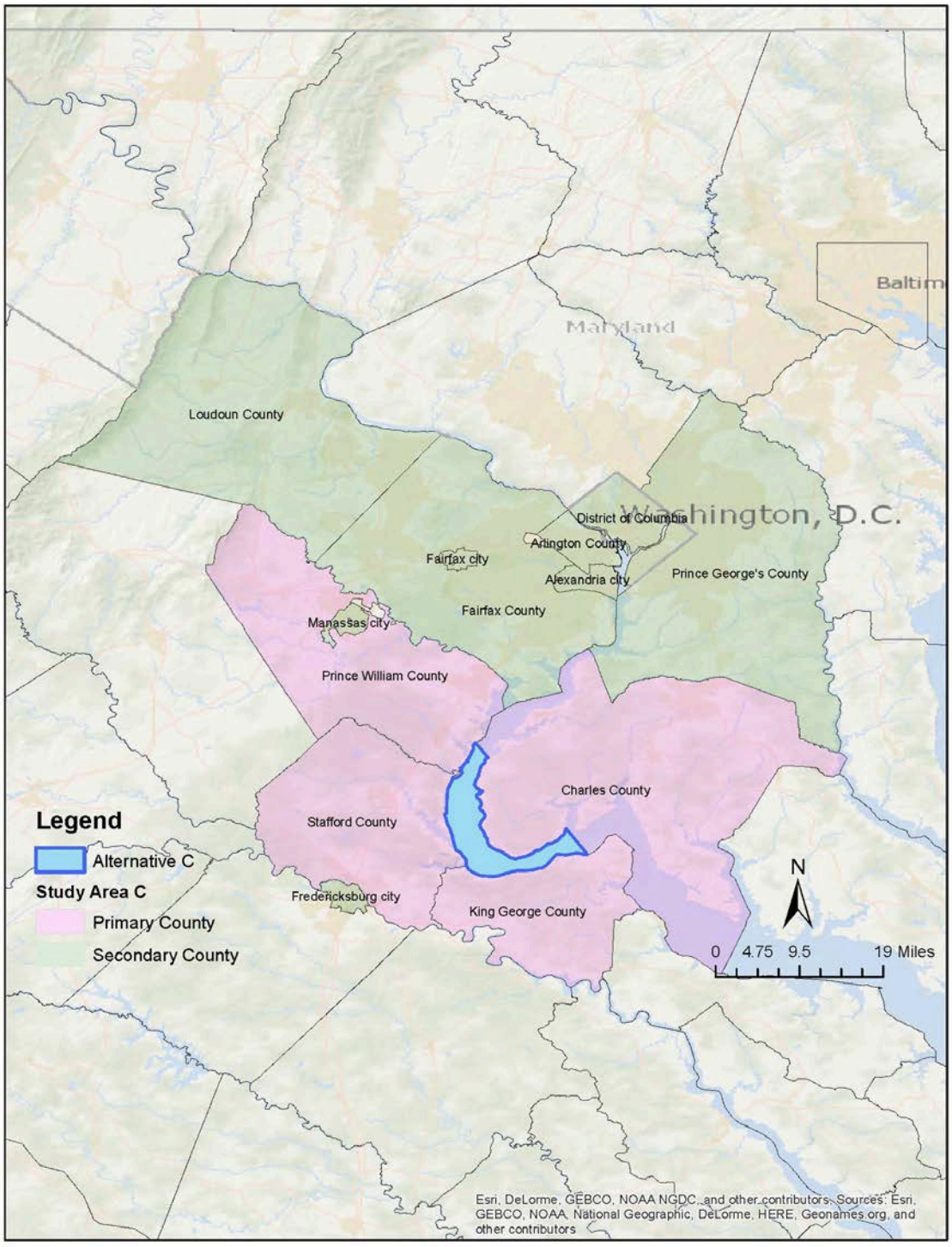


Figure 1.2 Alternative C Study Area (Preferred Alternative)

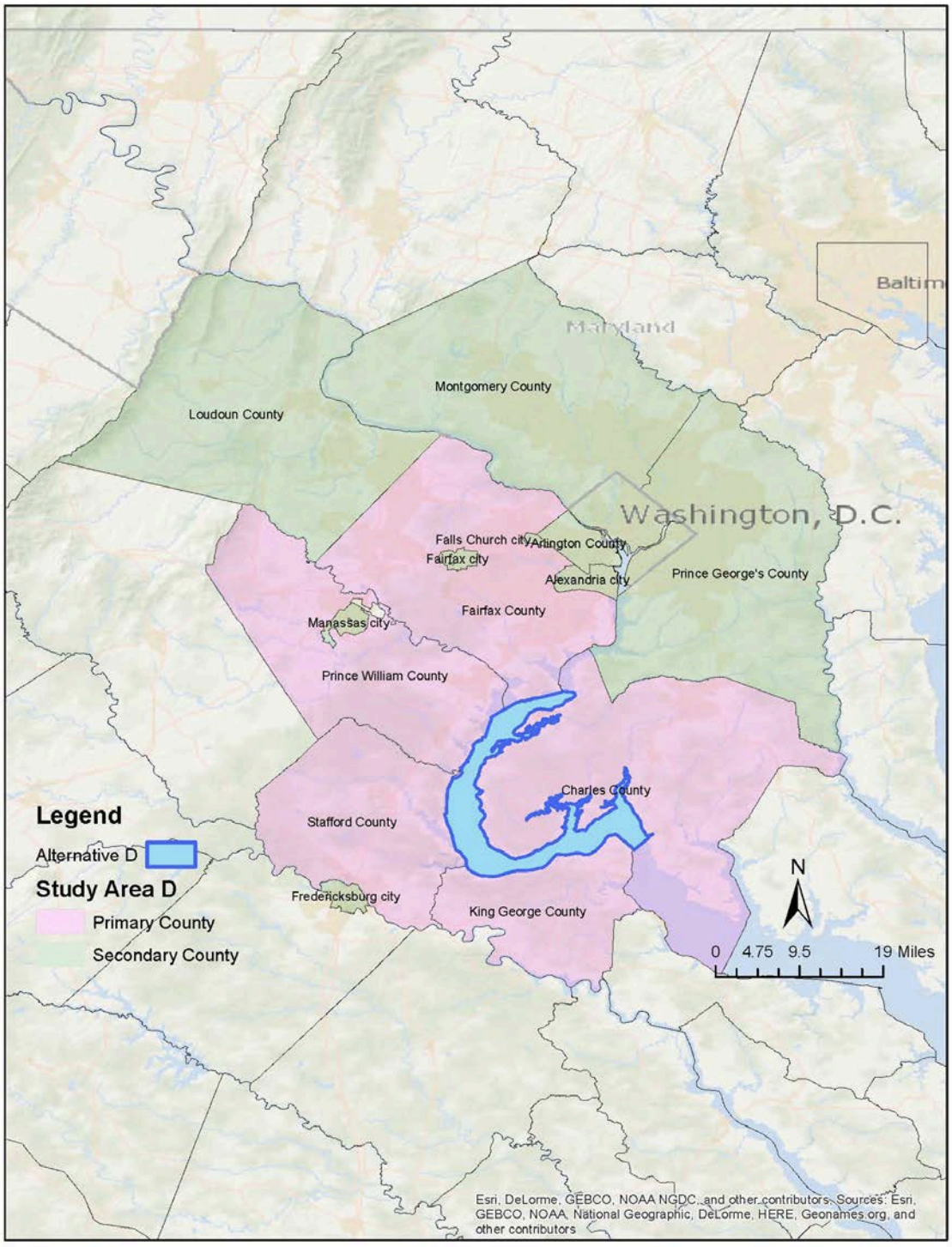


Figure 1.3 Alternative D Study Area

2. Population and Demographic Profiles

Population

Population is a major driver of any study area. ONMS Condition Reports which assess the conditions of sanctuary resources, account for population. Population may be a driver behind the pressures placed on sanctuary resources, while at the same time the population also benefits from the ecosystem services generated from sanctuary resources.

The study areas all have poverty rates that are below the national and state averages. Additionally, the per capita incomes are greater in the study areas than nationally or within the states. The rate of population growth from 2010-2014 is also greater in the study areas, and population within the study areas is expected to grow at a faster rate than the nation, Maryland or Virginia (Tables 2.1-2.4).

Table 2.1 Selected Socioeconomic Measures for Description of Study Areas

	2014 Population	*Population Change(%) 2010-2014*	*2014 Population Density*[1]	*2015 Per Capita Income ($)*	*2014 Persons Below Poverty (%)*	*2015 Unemployment Rate (%)*
Alternative B	3,376,608	6.9	1,390	59,609	9.4	4.9
Alternative C	4,170,639	8.0	1,317	61,962	8.9	4.6
Alternative D	5,188,800	7.6	1,419	64,124	8.5	4.4
Maryland	5,887,776	3.4	607	50,345	10.0	5.2
Virginia	8,185,131	4.4	207	54,176	11.5	4.4
United States	314,107,084	3.3	89	46,049	15.6	5.3

1. Number of people per square mile
Sources: U.S. Department of Commerce, Bureau of the Census and the Bureau of Economic Analysis, Regional Economic Information System.

Table 2.2 Population Growth and Projected Growth for Study Area B

Measurement/Time period	*US*	*Maryland*	*Virginia*	*Study Area B*
Population Growth (%)				
1990 to 2000	13.2	10.7	14.3	11.2
2000 to 2010	9.7	9.0	12.9	15.9
2010 to 2014	3.1	3.3	3.7	7.0
Population Projections (%)				
2014 to 2020	5.6	6.1	7.3	7.8
2020 to 2025	4.7	5.0	6.1	6.4

2025 to 2030	4.6	4.8	6.0	6.2
2030 to 2040	8.4	8.5	11.3	11.5
2040 to 2050	7.2	6.8	10.2	10.0

Sources: U.S. Department of Commerce, Bureau of the Census, Woods and Poole (2016).

Table 2.3 Population Growth and Projected Growth for Study Area C

Measurement/Time period	*US*	*Maryland*	*Virginia*	*Study Area C*
Population Growth (%)				
1990 to 2000	13.2	10.7	14.3	15.0
2000 to 2010	9.7	9.0	12.9	19.8
2010 to 2014	3.1	3.3	3.7	7.9
Population Projections (%)				
2014 to 2020	5.6	6.1	7.3	8.7
2020 to 2025	4.7	5.0	6.1	7.3
2025 to 2030	4.6	4.8	6.0	7.2
2030 to 2040	8.4	8.5	11.3	13.7
2040 to 2050	7.2	6.8	10.2	12.5

Sources: U.S. Department of Commerce, Bureau of the Census, Woods and Poole (2016).

Table 2.4 Population Growth and Projected Growth for Study Area D

Measurement/Time period	*US*	*Maryland*	*Virginia*	*Study Area D*
Population Growth (%)				
1990 to 2000	13.2	10.7	14.3	14.9
2000 to 2010	9.7	9.0	12.9	17.6
2010 to 2014	3.1	3.3	3.7	7.4
Population Projections (%)				
2014 to 2020	5.6	6.1	7.3	8.3
2020 to 2025	4.7	5.0	6.1	6.9
2025 to 2030	4.6	4.8	6.0	6.7
2030 to 2040	8.4	8.5	11.3	12.7
2040 to 2050	7.2	6.8	10.2	11.4

Sources: U.S. Department of Commerce, Bureau of the Census, Woods and Poole (2016).

Table 2.5 Unemployment Rates and Per Capita Personal Income for Study Area B

Measurement/Year	*US*	*Maryland*	*Virginia*	*Study Area B*
Unemployment Rate (%)				
2000	4.1	3.6	2.3	3.1
2005	5.2	4.2	3.6	3.9
2010	9.7	7.7	7.2	6.8
2015	5.3	5.2	4.4	4.9
Per Capita Income ($)				
2000	30,602	35,345	32,465	40,243
2005	35,904	43,301	40,036	48,478
2010	40,277	49,683	45,412	55,183
2014	46,049	54,176	50,345	59,609
Real Per Capita Income (2014$)				
2000	42,064	48,584	44,625	55,316
2005	43,515	52,480	48,523	58,754
2010	43,712	53,920	49,285	59,889
2014	46,049	54,176	50,345	59,609
Real Per Capita Income Growth Rates (%)				
2000-2005	3.4	8.0	8.7	6.2
2005-2010	0.5	2.7	1.6	1.9
2010-2014	5.3	0.5	2.2	-0.5

Sources: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System and the U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index

Table 2.6 Unemployment Rates and Per Capita Personal Income for Study Area C

Measurement/Year	*US*	*Maryland*	*Virginia*	*Study Area C*
Unemployment Rate (%)				
2000	4.1	3.6	2.3	2.8
2005	5.2	4.2	3.6	3.6
2010	9.7	7.7	7.2	6.4
2015	5.3	5.2	4.4	4.6
Per Capita Income ($)				
2000	30,602	35,345	32,465	40,940
2005	35,904	43,301	40,036	49,576
2010	40,277	49,683	45,412	56,779
2014	46,049	54,176	50,345	61,432
Real Per Capita Income (2014$)				
2000	42,064	48,584	44,625	56,275
2005	43,515	52,480	48,523	60,085
2010	43,712	53,920	49,285	61,621
2014	46,049	54,176	50,345	61,432
Real Per Capita Income Growth Rates (%)				
2000-2005	3.4	8.0	8.7	6.8
2005-2010	0.5	2.7	1.6	2.6
2010-2014	5.3	0.5	2.2	-0.3

Sources: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System and the U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index

Table 2.7 Unemployment Rates and Per Capita Personal Income for Study Area D

Measurement/Year	*US*	*Maryland*	*Virginia*	*Study Area D*
Unemployment Rate (%)				
2000	4.1	3.6	2.3	2.8
2005	5.2	4.2	3.6	3.5
2010	9.7	7.7	7.2	6.3
2015	5.3	5.2	4.4	4.4
Per Capita Income ($)				
2000	30,602	35,345	32,465	43,107
2005	35,904	43,301	40,036	52,042
2010	40,277	49,683	45,412	59,185
2014	46,049	54,176	50,345	63,757
Real Per Capita Income (2014$)				
2000	42,064	48,584	44,625	59,254
2005	43,515	52,480	48,523	63,074
2010	43,712	53,920	49,285	64,232
2014	46,049	54,176	50,345	63,757
Real Per Capita Income Growth Rates (%)				
2000-2005	3.4	8.0	8.7	6.4
2005-2010	0.5	2.7	1.6	1.8
2010-2014	5.3	0.5	2.2	-0.7

Sources: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System and the U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index

The next two figures present the information in Tables 2.5-2.7 in graphical form. The unemployment rates and the real per capita income growth rate by year and study area are shown below.

Unemployment rates in the study areas were consistently lower than the national average.

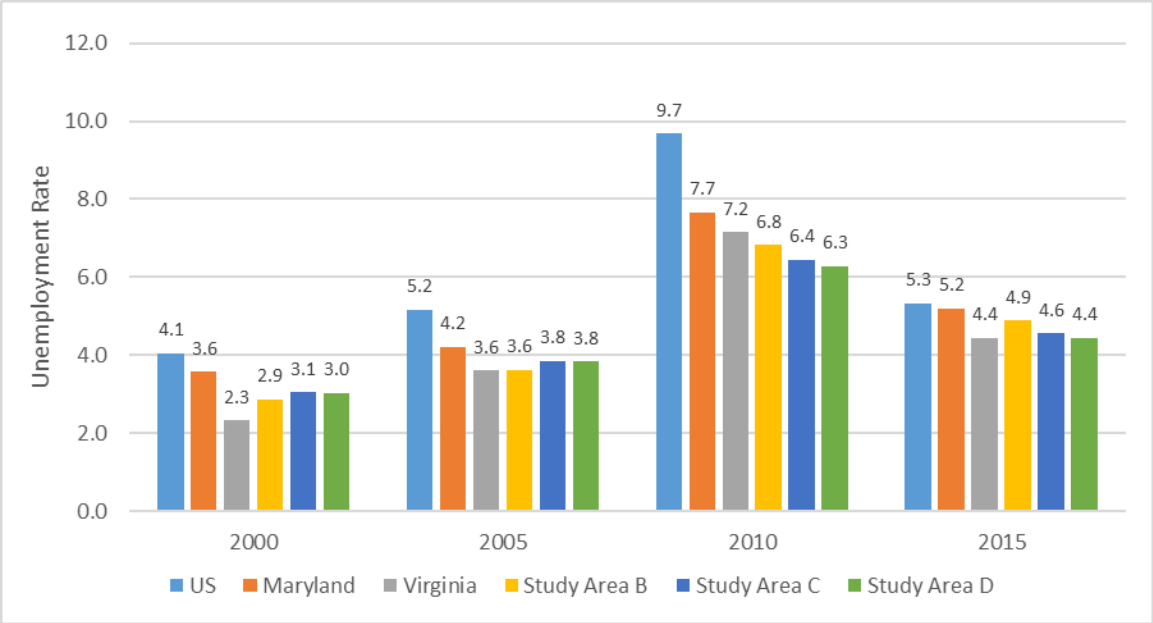


Figure 2.1 Unemployment Rate by Year and Study Area

The largest growth rates occurred from 2000-2005. From 2010-2014 there was a negative growth rate in the study areas.

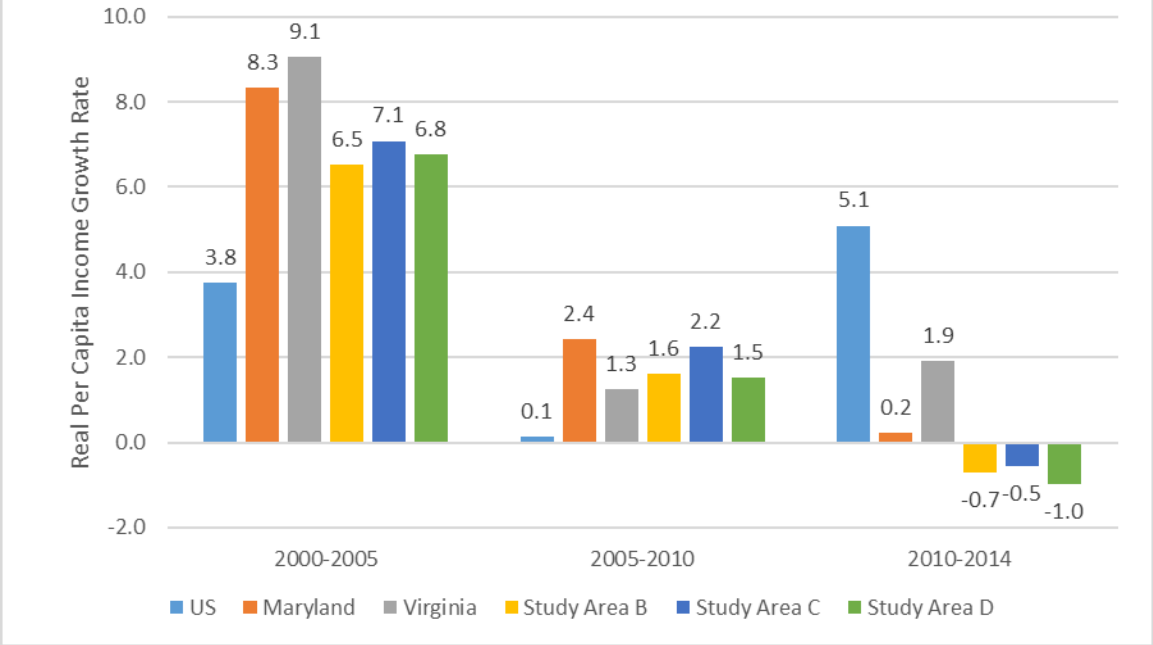


Figure 2.2 Per Capita Income Rate by Year and Study Area

Demographic Profiles

For demographic profiles, gender, race/ethnicity and age were chosen as the most important population characteristics.

Gender

In all years, study areas, Maryland, Virginia and US, women are more than half the population.

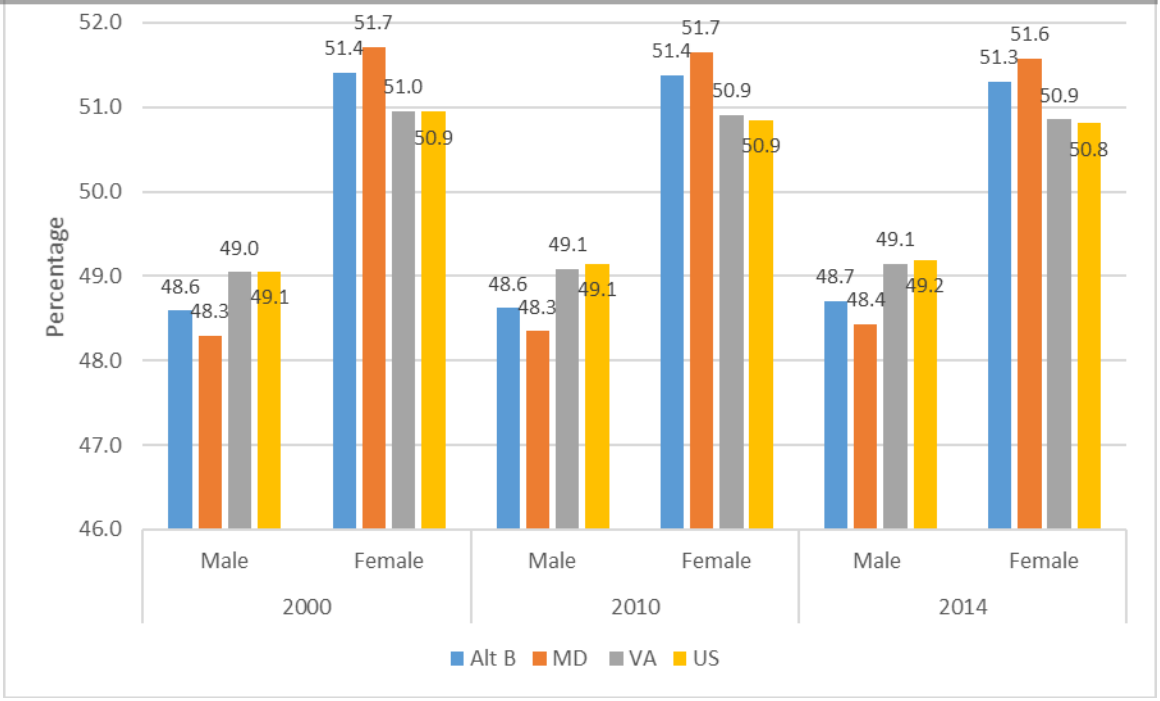


Figure 2.3 Gender Distributions for Study Area of Alternative B

In all years, study areas, Maryland, Virginia and US, women are more than half the population.

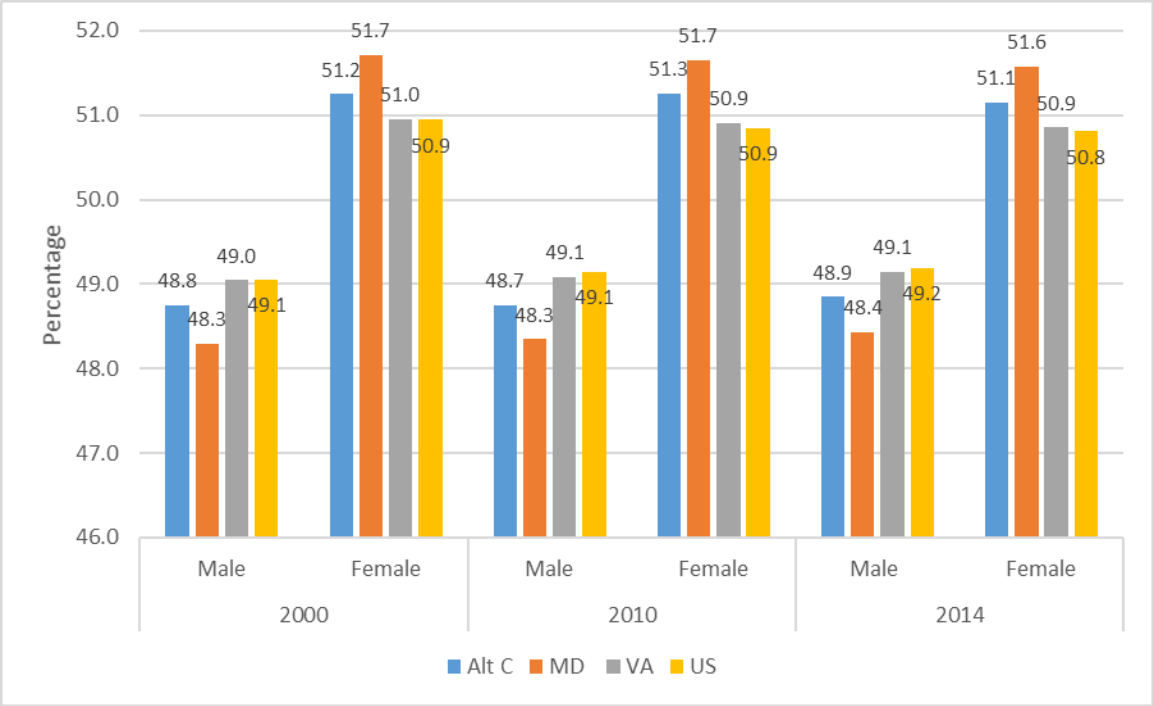


Figure 2.4 Gender Distributions for Study Area of Alternative C

In all years, study areas, Maryland, Virginia and US, women are more than half the population.

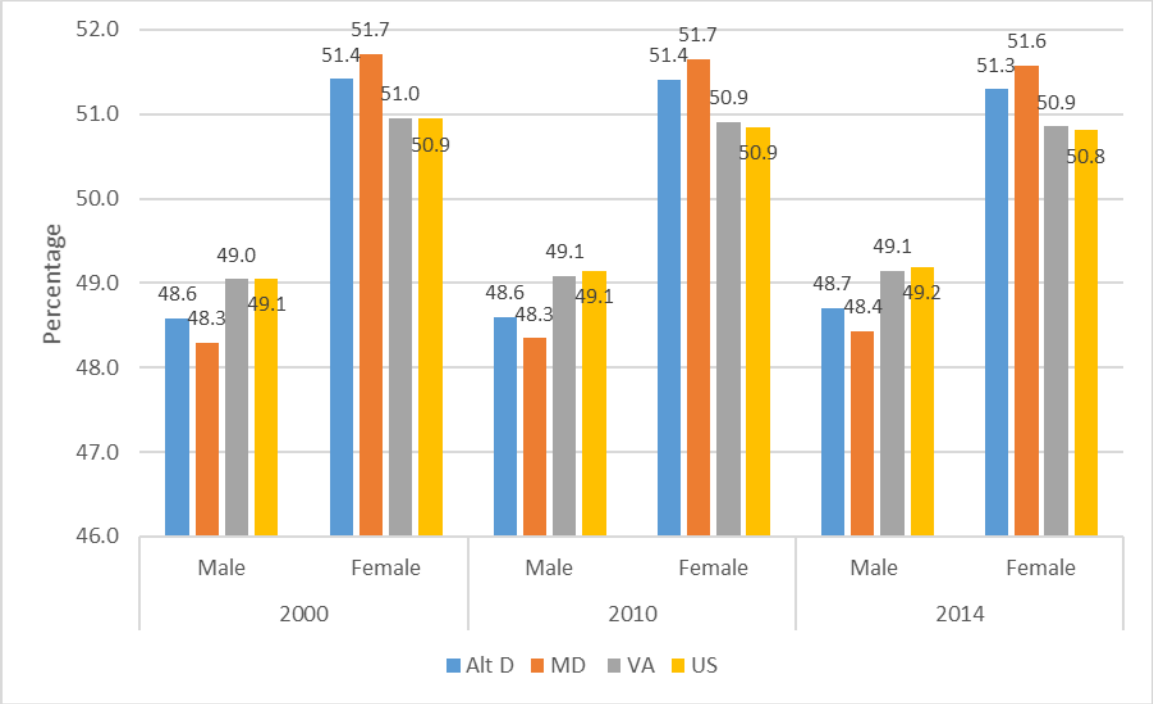


Figure 2.5 Gender Distributions for Study Area of Alternative D

Race & Ethnicity

Race and Ethnicity are treated separately in the Census of the U.S. Racial categories include “White”, “Black or African America”, “Asian”, “Alaskan Native or Native American”, “Native Hawaiian or Other Pacific Islander”, “Other” and “Multiple Races”. The graphs below present the statistics for “White”, “Asian” and “Black or African American”. The “Other” presented in the graphs below are the remaining race categories. Hispanic represents ethnicity and in the Census is recorded separately from race with any race being eligible for being Hispanic. In the Census, Hispanic is Hispanic, Latino or of Spanish Origin.

Tables 2.6-2.8 present the distributions of race in 2000, 2010 and 2014 for each study area. In all cases, the proportion of “white” and “black” has decreased over time in the study areas, and the portion of “Asian” and “other” has increased over time. It is also clear from Figure 2.9 that all three of the study areas are more diverse than Maryland, Virginia or the US. In each of the study areas, roughly half of the population is “white”, compared to nearly three-quarters of the population being “white” within the US. There are also higher proportions of “black”, “Asian” and “other” in the study areas compared to the US.

Proportion of “White” and “Black” declined, while the portion of “Asian” and “Other” increased from 2000-2014.

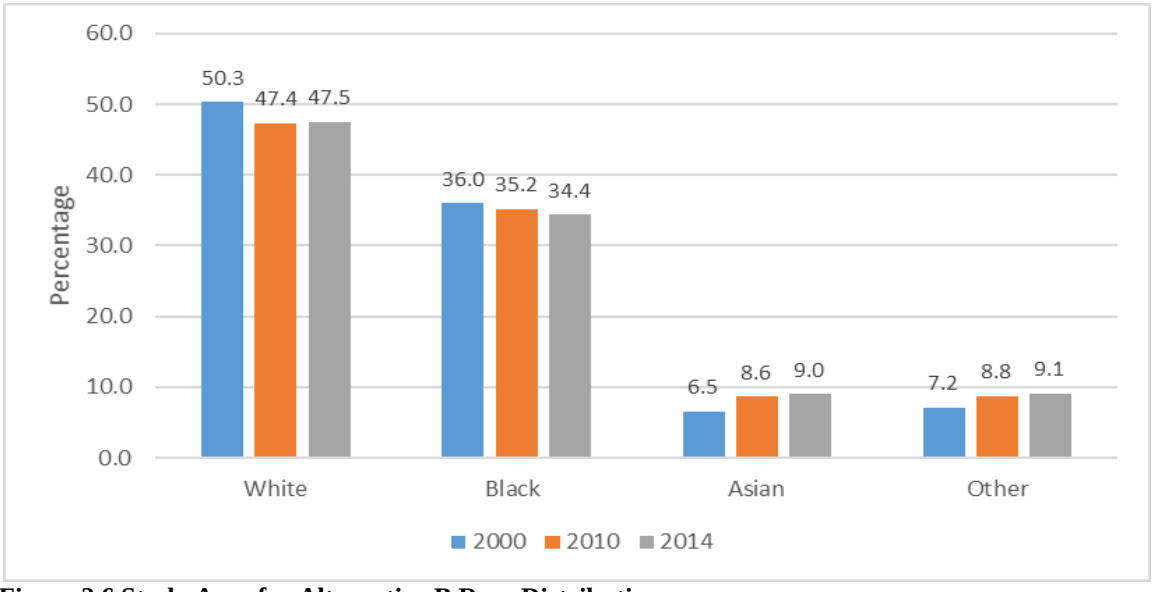


Figure 2.6 Study Area for Alternative B Race Distributions

Proportion of “White” and “Black” declined, while the portion of “Asian” and “Other” increased from 2000-2014.

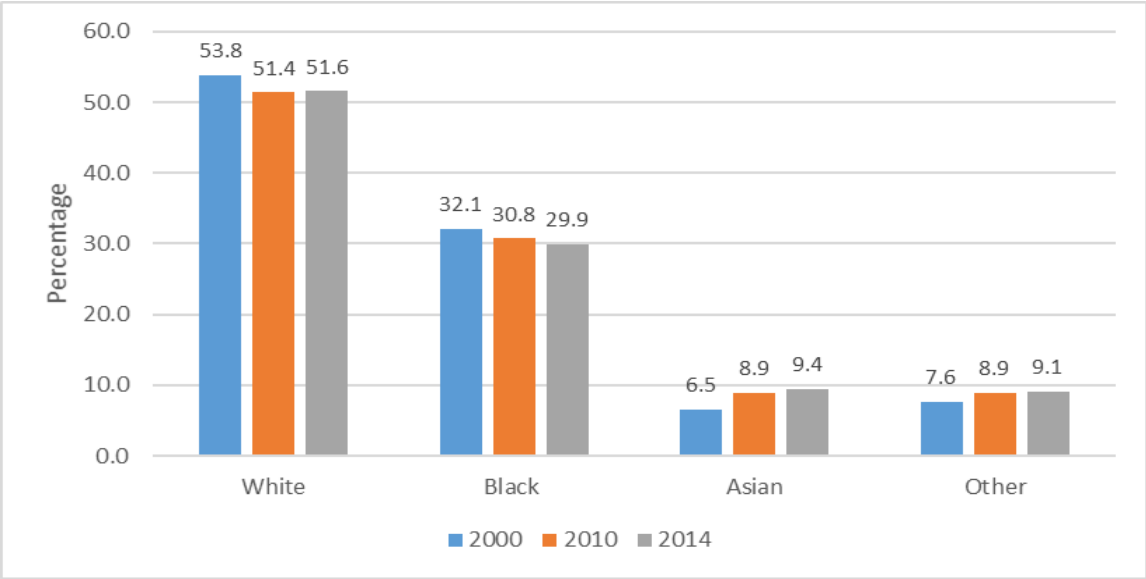


Figure 2.7 Study Area for Alternative C Race Distributions

Proportion of "White" and "Black" declined, while the portion of "Asian" and "Other" increased from 2000-2014.

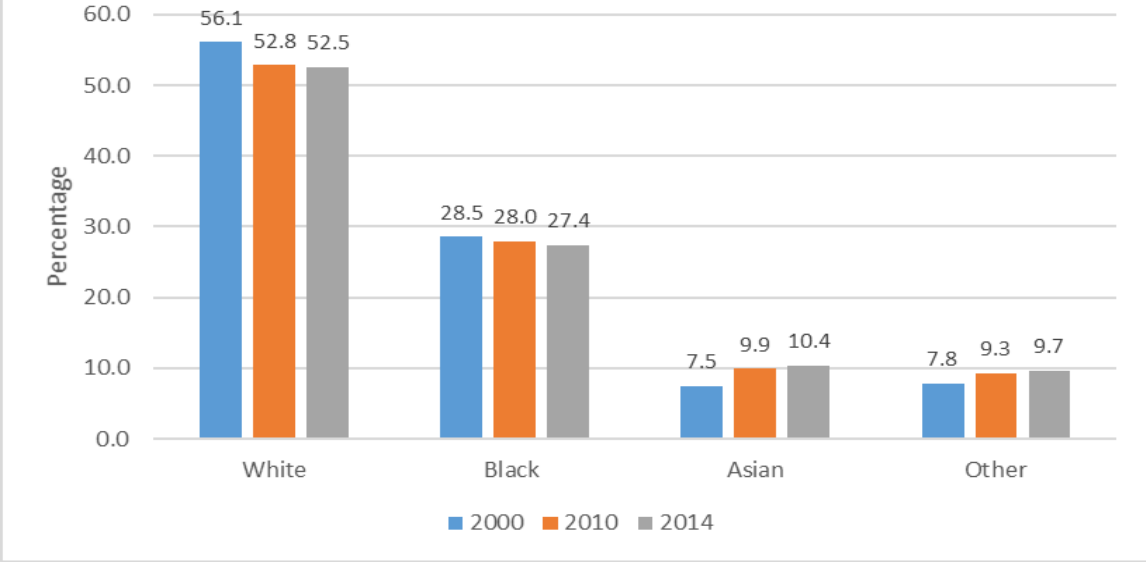


Figure 2.8 Study Area for Alternative D Race Distributions

All three of the study areas are more diverse than Maryland, Virginia and the US. Both Maryland and Virginia are more diverse than the US.

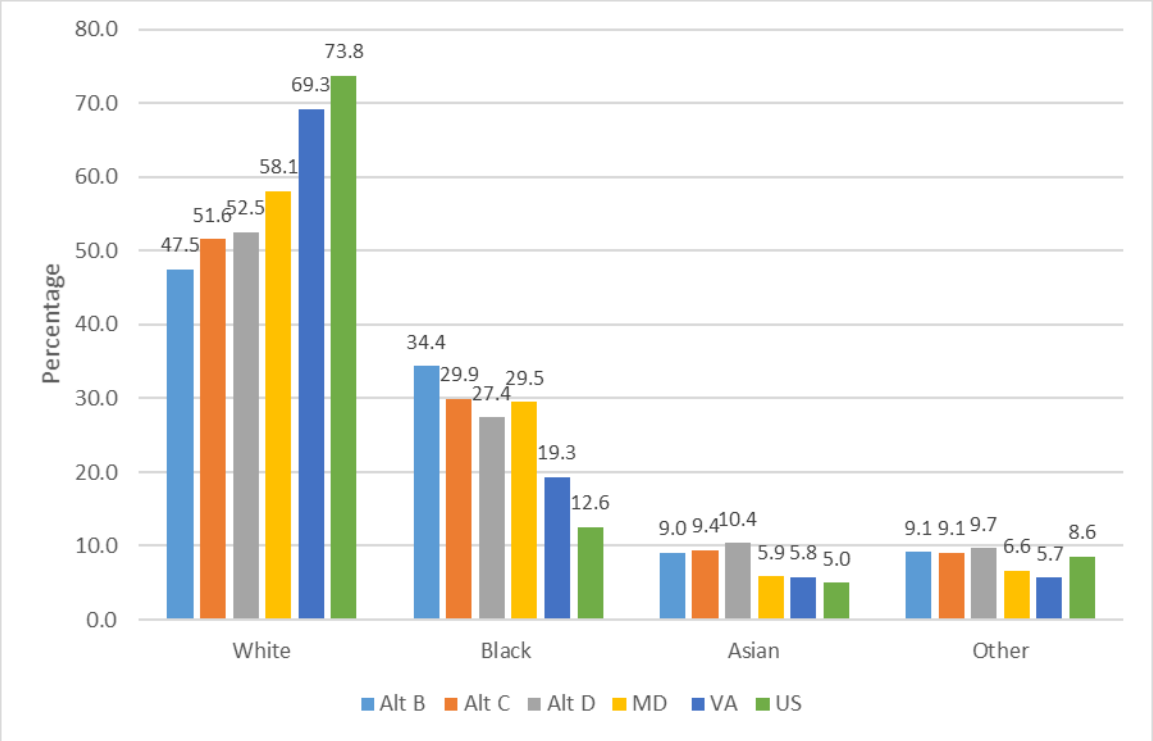


Figure 2.9 Distribution of Race by Study Areas, 2014

Age

Over time, the populations of each of the study areas saw an increase in the percentage of the older categories (Figures 2.17-2.19). The highest proportion of the population is between the ages of 20-34 in all study areas. In general, the study areas have higher percentages of the younger age categories and lower percentages of the older age categories when compared to the Maryland, Virginia and the US in 2014 (Figures 2.20-2.22).

Over time the age distribution of Study Area B is increasing in age, when year 2000 is compared to 2014. In all years, the highest proportion of the population is age 20-34.

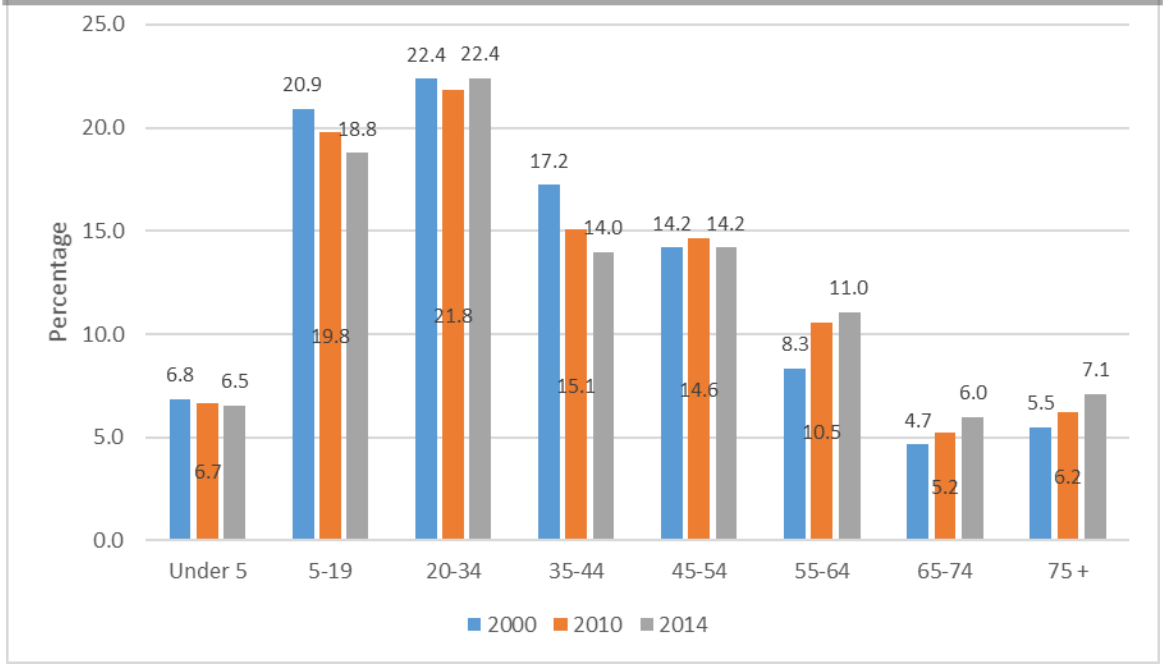


Figure 2.10 Age Distributions for Study Area of Alternative B, 2000-2014

Over time the age distribution of Study Area C is increasing in age, when year 2000 is compared to 2014. In all years, the highest proportion of the population is age 20-34.

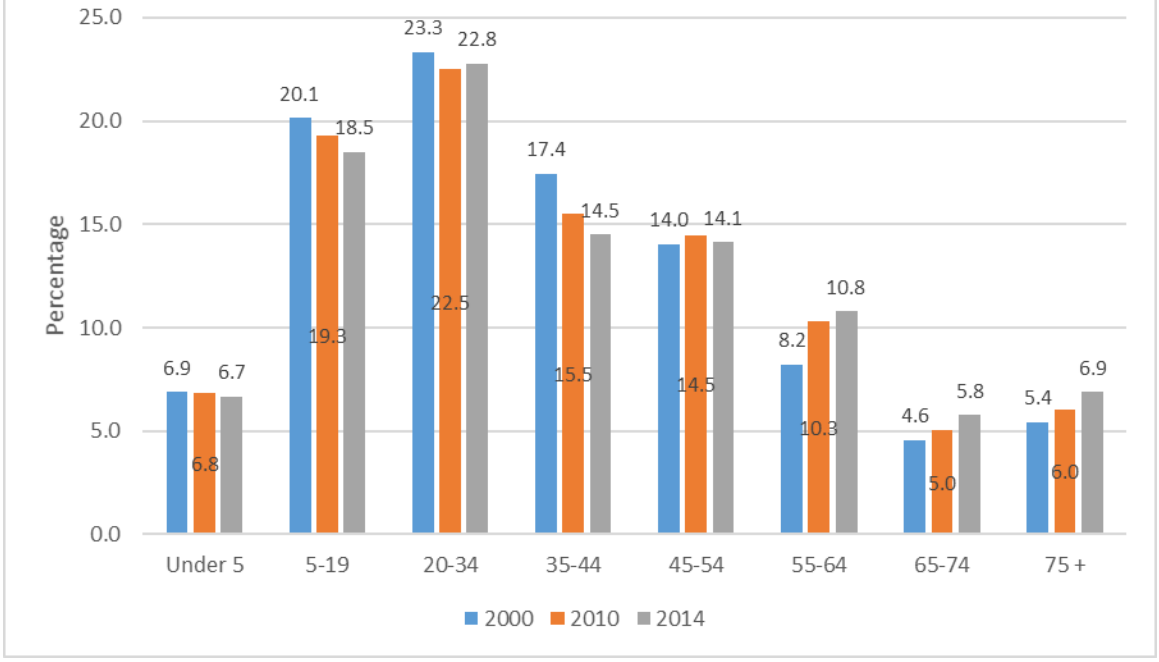


Figure 2.11 Age Distributions for Study Area of Alternative C, 2000-2014

Over time the age distribution of Study Area D is increasing in age, when year 2000 is compared to 2014. In all years, the highest proportion of the population is age 20-

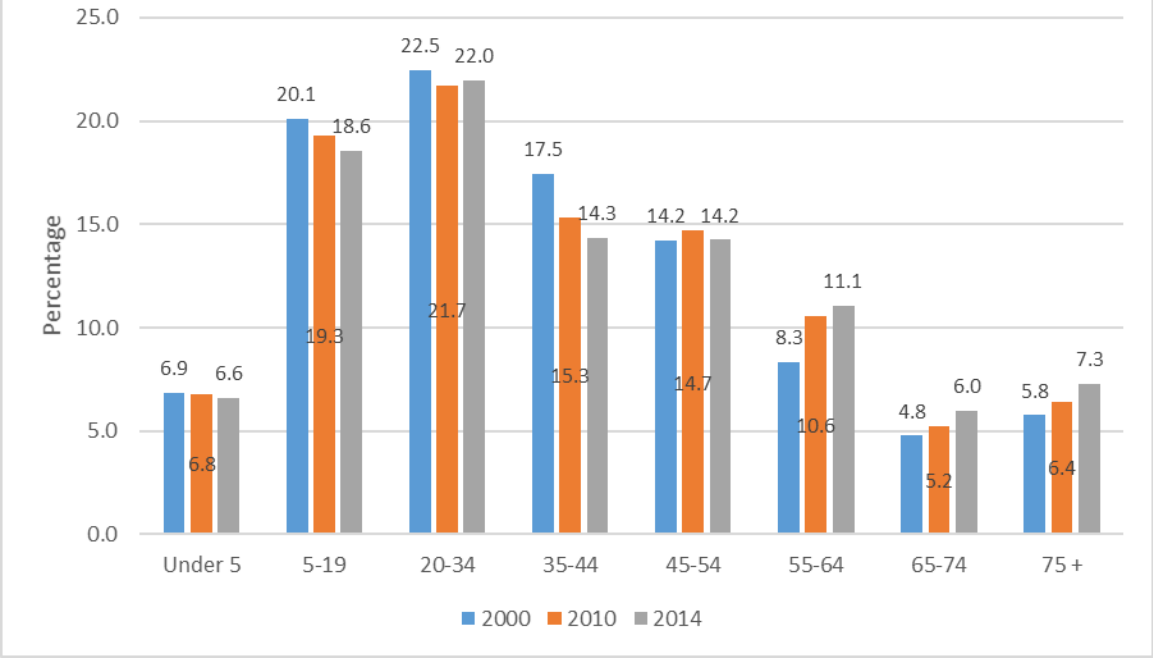


Figure 2.12 Age Distributions for Study Area of Alternative D, 2000-2014

In 2014, the highest proportion of the population is age 20-34. There is a higher proportion of people in the four youngest categories in Study Area B compared to MD, VA and the US.

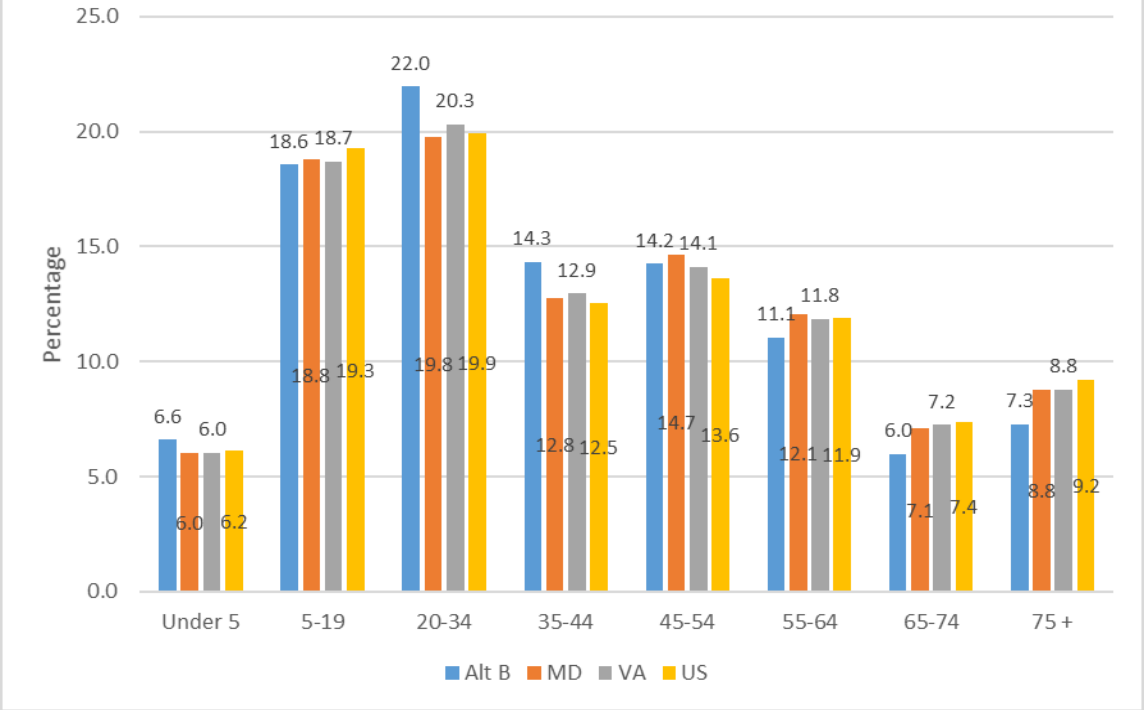


Figure 2.13 Age Distributions Across Study Alternative B, MD, VA and US, 2014

In 2014, the highest proportion of the population is age 20-34. There is a higher percentage of people in the youngest categories in Study Area C than the MD, VA & US.

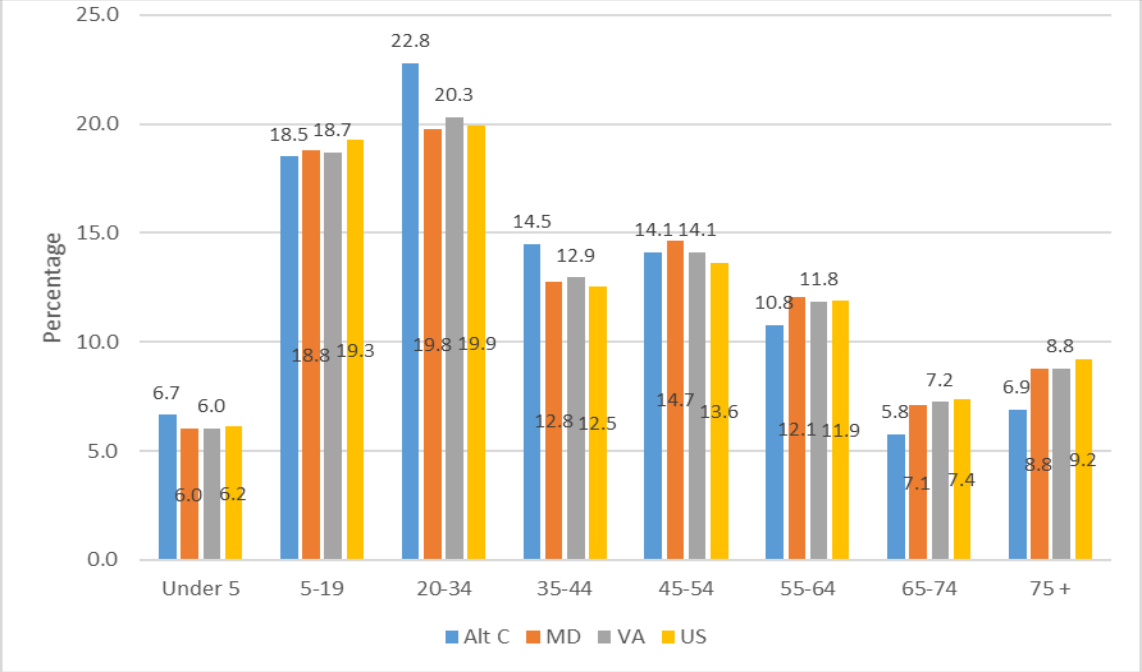


Figure 2.14 Age Distributions Across Study Alternative C, MD, VA and US, 2014

In 2014, the highest proportion of the population is age 20-34. There is a higher percentage of people in the youngest categories in Study Area D than the MD, VA & US.

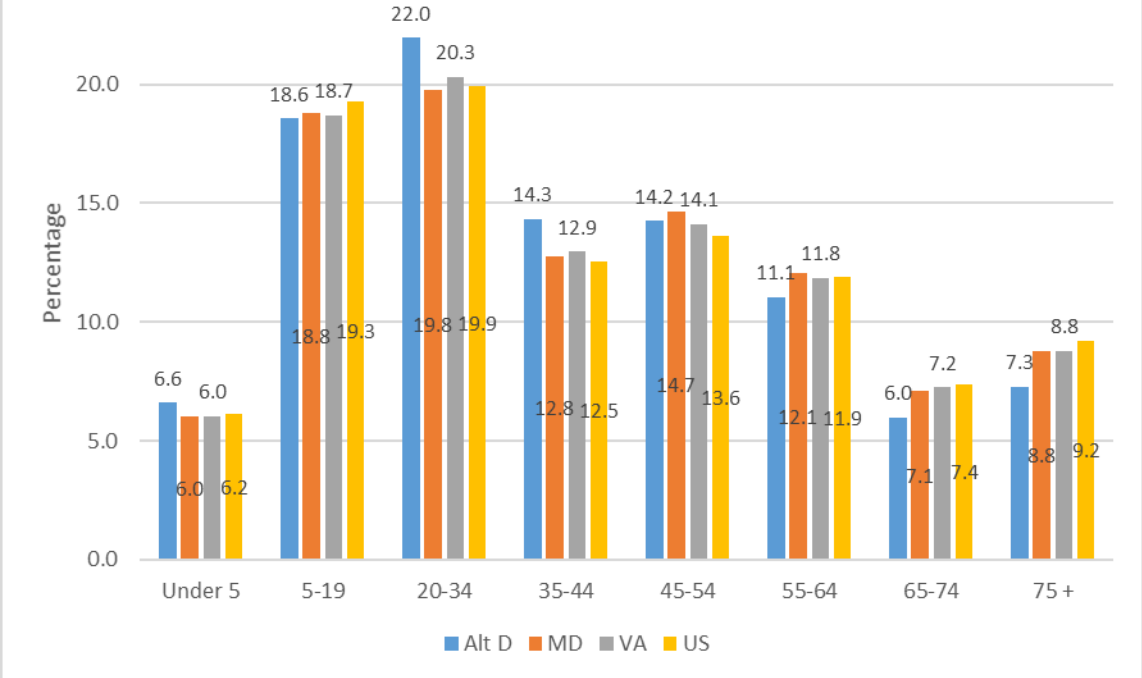


Figure 2.15 Age Distributions Across Study Alternative D MD, VA and US, 2014

3. Economic Profiles

In the previous section, we addressed a couple of key indicators of the health of the economy using per capita income, poverty rates and unemployment rates. Here we look at the total personal income both generated within the study areas (income by place of work) and what is received by residents of the study areas (income by place of residence). The U.S. Department of Commerce, Bureau of Economic Analysis maintains the national income accounts on both these bases. People that live in a given area often receive income not derived by work in the area where they live. Many people commute to work to places of work outside the county where they live. People receive interest, dividends and capital gains from investments. Retirees receive pensions and social security payments. The unemployed receive unemployment compensation. Income-by-Place-of-Work as a percent of Income-by-Place-of-Residence is usually a good indicator of an area having a significant retirement community. Sources of income not tied to the status of work in the local economy can provide more resilience to an economy making it less subjected to ups and downs of local work.

The labor force and total employment and their growth rates are good indicators of a healthy or stagnant economy and the opportunities for employment. These are important elements in assessing whether people can adapt to changes in resources management/policy decisions that may displace them from resource use.

Proprietors' income and employment and the proportion of the study area's income and employment accounted for by proprietors of businesses is also analyzed. This is usually a good indicator of small businesses which are often those connected to resource use in the sanctuary (e.g. commercial fishing operations and recreational and tourist related businesses).

Next, personal income and employment by industry sector is presented. This is important for economic impact analyses of resource management/policy decisions. This helps to map the spending in the local economy related to resource use in the sanctuary to economic sectors, then input-output models such as the IMPLAN model can be used to estimate the multiplier impacts on the local economy and assess the proportion of the local economy affected.

There are some problems with obtaining complete information by economic sector for any county since there are rules that don't allow the government to publish data on a sector in a county if there are less than 10 firms in the county. The data gets reported as "D" meaning "Non-disclosure". For the study area totals, the totals for a sector are reported here as "NA" or not available if at least one county in the study area has, within a given sector, less than 10 firms in that sector. It may be possible to get study area totals for the sector of special request from the U.S. Department of Commerce, Bureau of

Economic Analysis if there are more than 10 firms in the sector throughout the study area, but not if one could derive sector estimates if one county was the source of non-disclosure.

Labor Force

From 2000=2015 the labor force grew by more than 1.3 million people in each of the study areas. The labor force grew slower in all study areas and the US, MD and VA from 2010-2014 versus the 2000-2005 and 2005-2010 time periods. Alternative C had the highest growth rates in all three time periods.

Table 3.1 Labor Force and Labor Force Growth Rates in All Study Areas, 2000-2015

Year	*Alt B*	*Alt C*	*Alt D*	*US*	*MD*	*VA*
2000	1,567,857	1,908,389	2,402,192	143,893,664	2,684,981	3,561,890
2005	1,661,280	2,059,394	2,570,232	149,390,851	2,809,578	3,849,554
2010	1,809,131	2,257,347	2,797,278	155,539,424	3,073,831	4,157,667
2015	1,892,762	2,375,313	2,932,397	158,390,332	3,151,932	4,240,476
Labor Force Growth (%)	*Alt B*	*Alt C*	*Alt D*	*US*	*MD*	*VA*
2000-2005	5.6%	7.3%	6.5%	3.7%	4.4%	7.5%
2005-2010	8.2%	8.8%	8.1%	4.0%	8.6%	7.4%
2010-2014	4.4%	5.0%	4.6%	1.8%	2.5%	2.0%

Source: U.S. Department of Labor, Bureau of Labor Statistics.

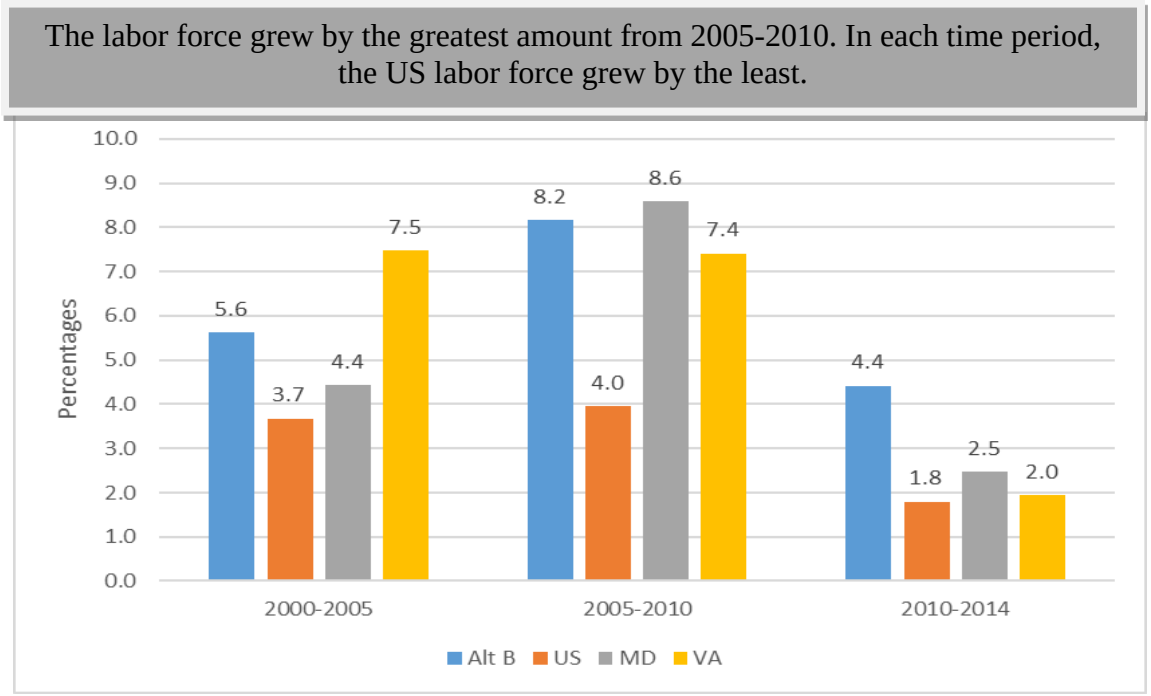


Figure 3.1 Labor Force Growth for Study Area of Alternative B

The labor force grew by the greatest amount from 2005-2010. In each time period, the US labor force grew by the least.

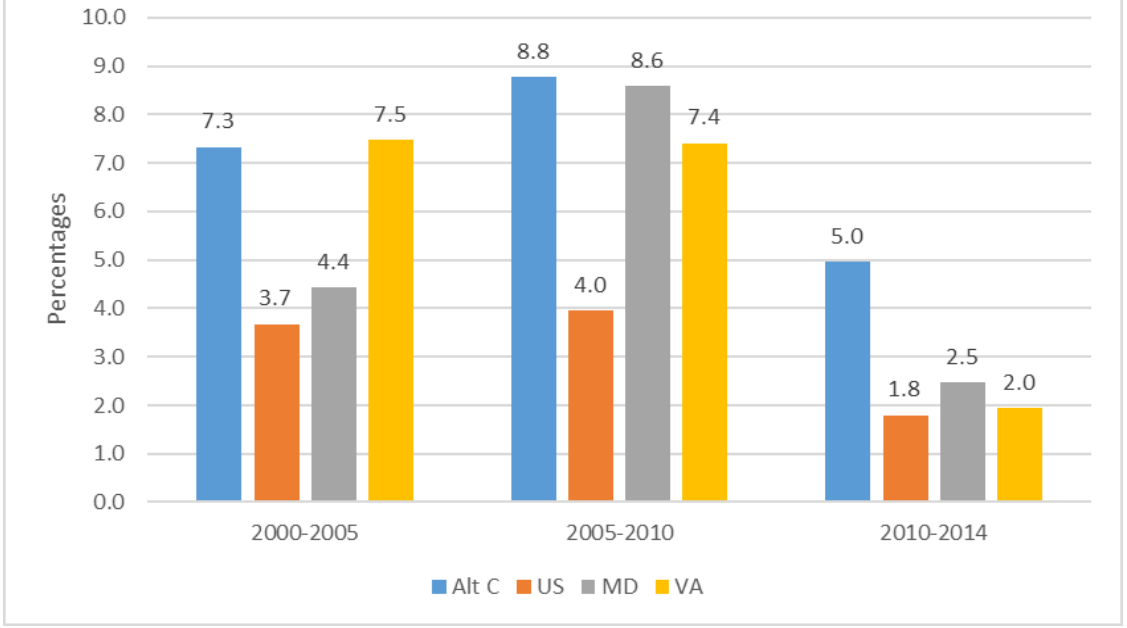


Figure 3.2 Labor Force Growth for Study Area of Alternative C

The labor force grew by the greatest amount from 2005-2010. In each time period, the US labor force grew by the least.

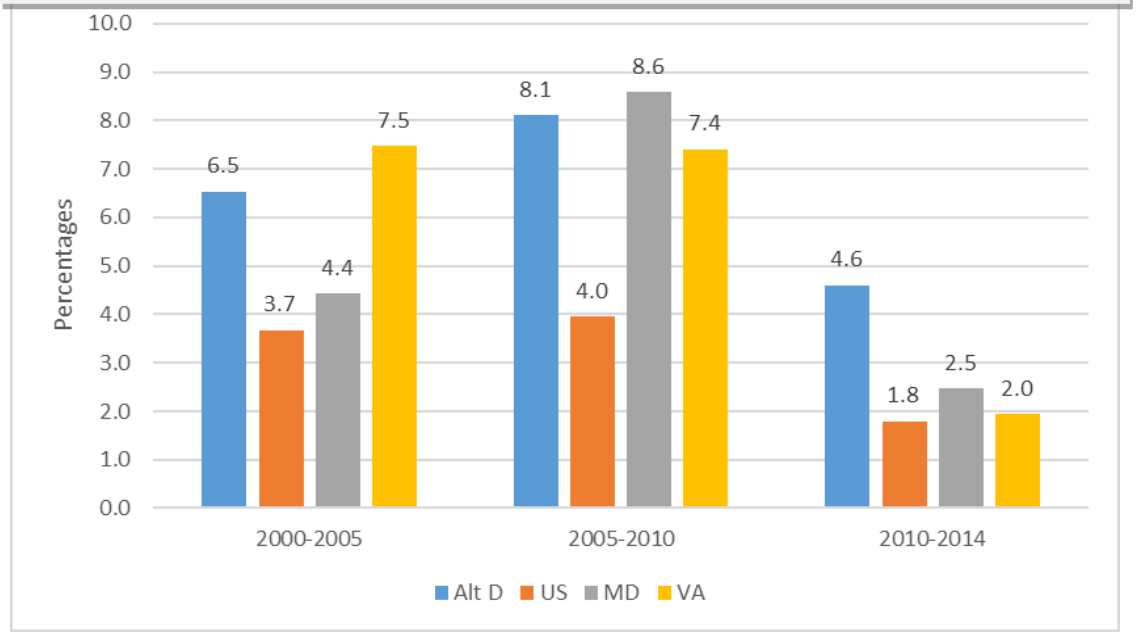


Figure 3.3 Labor Force Growth for Study Area of Alternative D

Personal Income

The U.S. Department of Commerce, Bureau of Economic Analysis (BEA) maintains two concepts of personal income in their Regional Economic Information System. Income is reported by "place of work" and by "place of residence". Income by "place of work" is where the income is generated by work in the geographic area of study, and it's reported by economic sector (e.g. farm, manufacturing, retail, wholesale, etc.). Income by "place of residence" is reported by where the income is received. It is the total amount of income received by those who live in the study area. It includes income from investments, pensions, social security payments and other transfer payments. In addition, it includes income earned in areas from work outside the study area. This would include the income earned in a county where one works which is outside the study area. The amount of income earned by people who live outside the Study Area is subtracted as they take their incomes home to areas outside the study area. This information comes from the 'Census of Inter-county Commuters" and BEA uses it to form what is called the "residence adjustment" which can be either positive or negative depending on whether people living in the study area and working outside the study area are earning more or less than people living outside the study area and working inside the study area. Economists often refer to this as the "bedroom community effect". In using the IMPLAN input-output model to estimate the economic impacts of activity in the study area, an important first step is defining the study area of impact. Since IMPLAN assumes that all those who work in the study area live in the study area and thus spend most of their income there, defining the study area such that the "bedroom community effect" is small makes estimates more accurate. Income by "place of work" as a percent of income by "total income by place of residence" serves as an indicator of two key aspects of a study area's economy: whether it is an economy with a significant "bedroom community" and/or there is a large retirement community. When the percent of income by place of work is low relative to income by place of residence (below 100%, Table 3.2), economists then look to the "residence adjustment" and the amount of transfer payments in pensions and social security payments to further describe the nature of the local economy.

In the table below, the income by place of residence and place of work are presented for each study area, the US, MD and VA in 2005, 2010 and 2015. In 2010 the percentage of income in the place of residence to place of work is the lowest for all study area alternatives. This ratio was always the highest for Alternative B's study area.

Table 3.2 Personal Income by Place of Residence and Place of Work, 2005-2014

Year/Area	*Income by Place of Work (000's $)*	*Income by Place of Residence (000's $)*	*Work as a Percent of Residence*
2005			
Alternative B	158,229,839	152,791,196	96.6
Alternative C	193,305,825	185,700,409	96.1
Alternative D	250,456,424	224,017,297	89.4
US	10,610,320,000	8,061,341,000	76.0
MD	242,154,652	167,746,673	69.3
VA	303,358,956	228,876,918	75.4
2010			
Alternative B	191,825,719	152,791,196	79.7
Alternative C	238,460,476	185,700,409	77.9
Alternative D	305,903,327	224,017,297	73.2
US	12,459,613,000	8,975,826,000	72.0
MD	287,571,318	194,883,721	67.8
VA	364,452,113	264,070,143	72.5
2015			
Alternative B	220,229,372	206,566,820	93.8
Alternative C	276,379,379	250,621,813	90.7
Alternative D	352,099,396	301,885,508	85.7
US	14,683,147,000	10,584,038,000	72.1
MD	323,778,035	218,825,355	67.6
VA	419,184,911	293,622,194	70.0

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System.

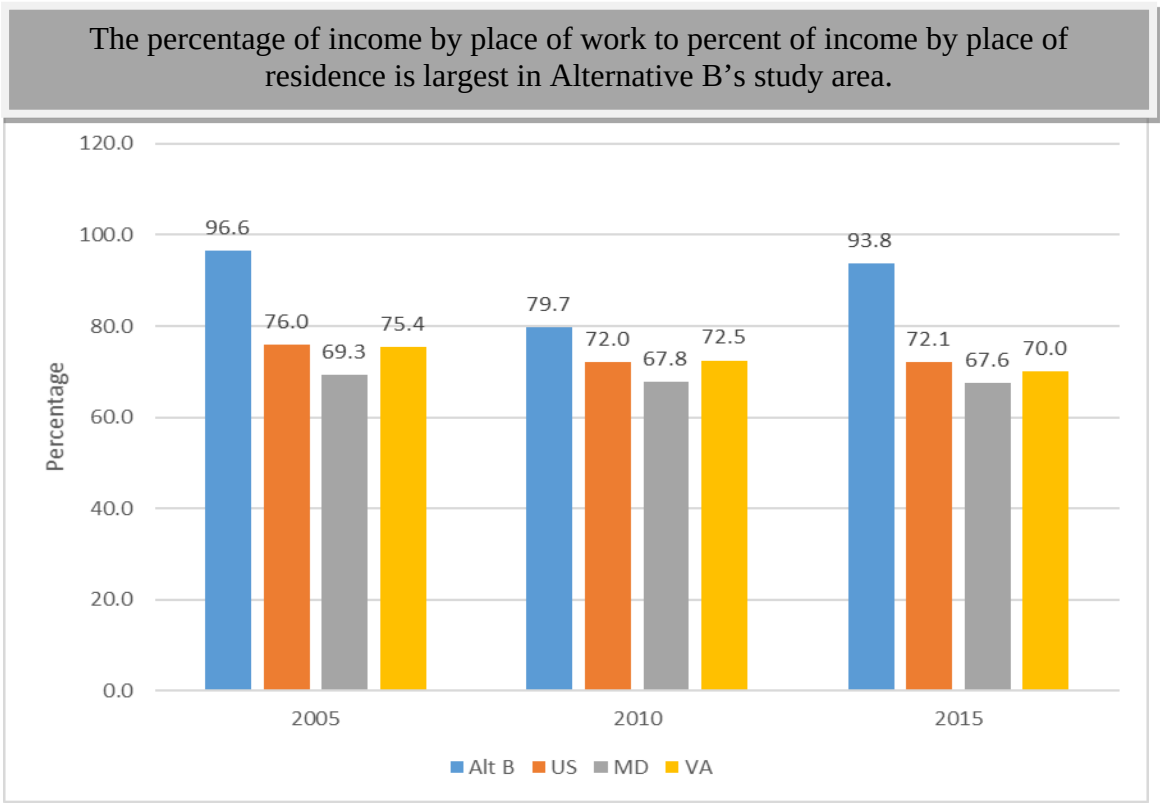


Figure 3.4 Alternative B Study Area - Income by Place of Work as a Percent of Income by Place of Residence

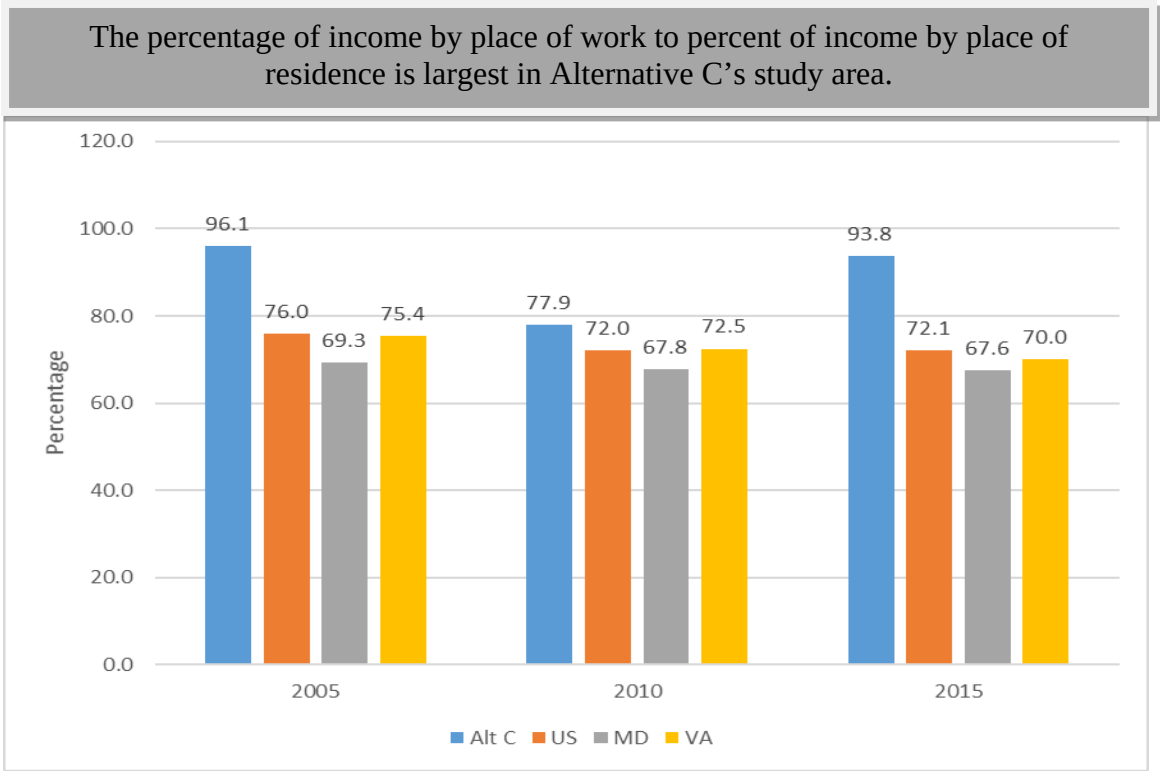


Figure 3.5 Alternative C Study Area - Income by Place of Work as a Percent of Income by Place of Residence

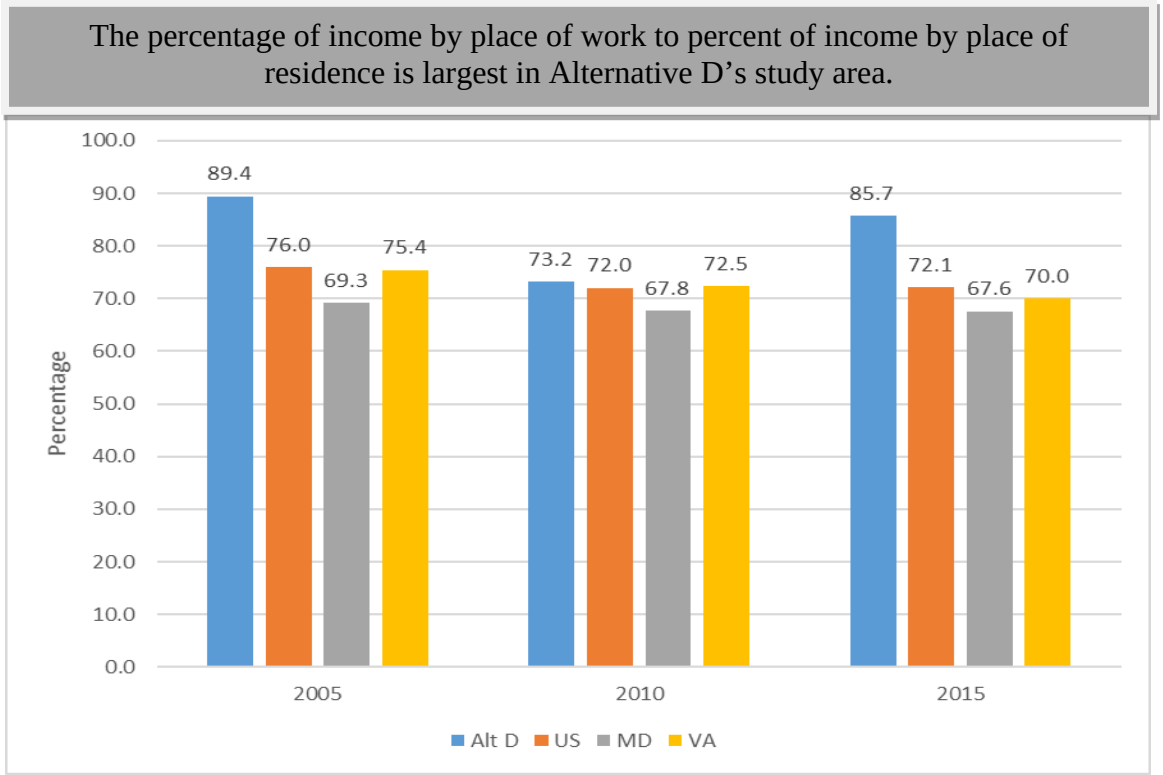


Figure 3.6 Alternative D Study Area - Income by Place of Work as a Percent of Income by Place of Residence

Employment

This section presents information for each alternative's study area on employment. The level of employment has increased in all study areas between 2000 and 2015. However, the impacts of the "Great Recession" can be seen in the US and in Alternatives C and D. Between 2005-2010 the study areas experienced the slowest growth rates for the time periods analyzed, and the US saw a negative employment growth rate.

Table 3.3 Employment by Year and Study Area

Year	***Alt B***	***Alt C***	***Alt D***	***US***	***MD***	***VA***
2000	1,519,808	1,854,921	2,335,750	138,065,714	2,588,829	3,479,018
2005	1,596,821	1,984,977	2,479,863	141,684,219	2,691,149	3,711,099
2010	1,685,602	2,111,755	2,621,487	140,469,276	2,838,494	3,860,390
2015	1,800,461	2,266,893	2,801,963	149,950,942	2,988,105	4,051,913
Employment Growth Rate	**Alt B**	**Alt C**	**Alt D**	**US**	**MD**	**VA**
2005-2005	5.1	7.0	6.2	2.6	4.0	6.7
2005-2010	5.6	6.4	5.7	(0.9)	5.5	4.0
2010-2015	6.8	7.3	6.9	6.7	5.3	5.0

Source: U.S. Department of Commerce, Bureau of Economic Analysis,
Regional Economic Information System

Alternative B saw a steady increase in employment growth rate and increased faster than the US, MD & VA in all time periods except 2000-2005

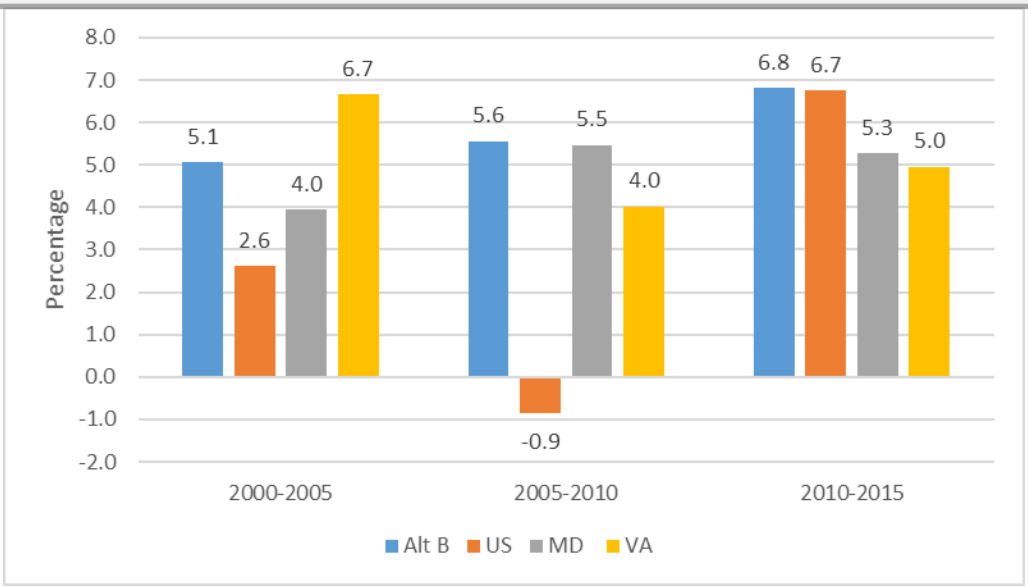


Figure 3.7 Alternative B's Study Area Total Employment Growth Rates

Alternative C's growth rate exceeded that of the US, MD & VA in all time periods.

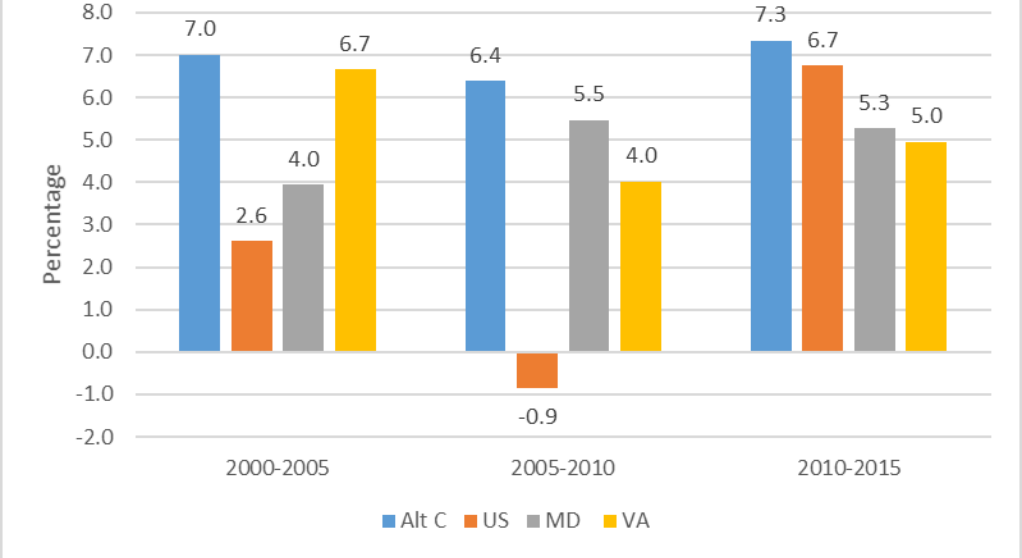


Figure 3.8 Alternative C's Study Area Total Employment Growth Rates

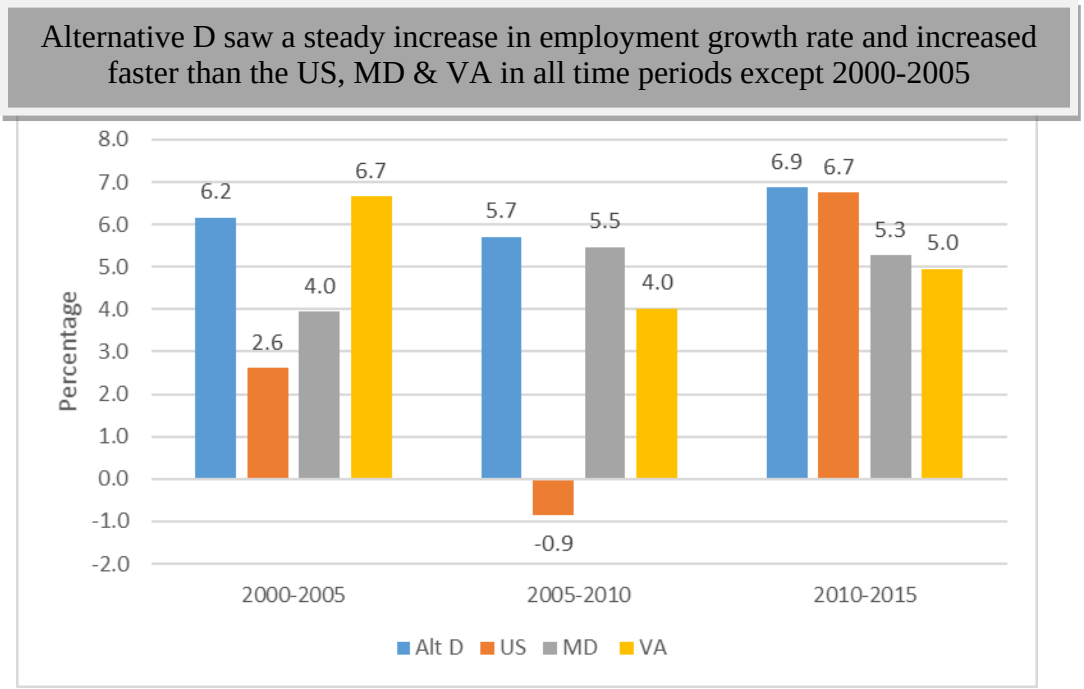


Figure 3.9 Alternative D's Study Area Total Employment Growth Rates

Proprietor's Income and Employment

When analyzing the potential impacts of sanctuary management strategies and regulations, it is a requirement under the Regulatory Flexibility Act to analyze the potential impacts of small entities, which are primarily small businesses. Usually almost all businesses related to either the commercial fishing industry or the recreation-tourist industry are small businesses. Good indicators of the extent of small businesses in the study area are the extent of proprietor's income and employment.

The information used in this section is from the Bureau of Economic Analysis (BEA). The geographic reporting of this area is different than the census. In some cases, the BEA aggregates different special district cities or counties that are in close proximity to one another. For these reasons, there may be some additional counties or special district cities included in the study areas. The table below shows how the special district cities/counties are represented in each study area for Proprietor's Income and Employment, Personal Income by Industry and the Employment by Industry Sections.

Table 3.4 Study Areas by BEA Classification of Geographies

City/County	Alternative B	Alternative C	Alternative D
Alexandria City, VA		Secondary	Secondary
Arlington County, VA		Secondary	Secondary
Charles County, MD	Primary	Primary	Primary
District of Columbia	Secondary	Secondary	Secondary
Fairfax County, Fairfax City, Fall's Church, VA	Secondary	Secondary	Secondary
King George's County, VA		Primary	Secondary
Loudon County, VA		Secondary	Secondary
Montgomery County, MD			Secondary
Prince George's, MD	Secondary	Secondary	Secondary
Prince William County, Manassas County, Manassas Park, VA.	Secondary	Primary	Secondary
Spotsylvania, Fredericksburg City, VA	Secondary	Secondary	Secondary
Stafford County, VA	Primary	Primary	Primary

In 2015, there was nearly a half a million proprietors employed in Alternative B's study area, making up 18.9% of the total employment. Study areas B and C have a lower percentage of proprietors when compared to the US and MD in 2015. The table below shows proprietor's income and employment and the percentage of proprietor's total income and employment for each study area, US, MD and VA.

Table 3.5 Proprietor's Income and Employment

Year/Area	*Proprietor's Income ($000)*	*%*	*Proprietor's Employment*	*%*
2001				
Alt B	$10,977,576	8.5	298,387	13.6
Alt C	$12,467,671	8.1	351,520	13.3
Alt D	$15,905,848	7.9	465,841	14.4
US	$839,053,000	9.3	28,188,200	17.0
MD	$12,981,395	6.6	516,664	16.6
VA	$15,713,768	6.5	654,839	14.8
2005				
Alt B	$13,559,188	8.6	364,602	15.5
Alt C	$15,471,764	8.0	429,524	15.1
Alt D	$20,643,106	8.2	567,440	16.3
US	$982,632,000	9.3	32,997,400	19.1
MD	$17,588,593	7.3	638,365	19.3
VA	$20,226,478	6.7	787,865	16.7
2010				
Alt B	$14,578,181	7.6	425,442	17.4
Alt C	$16,786,781	7.0	507,980	17.1
Alt D	$24,834,720	8.1	668,381	18.5
US	$1,029,442,000	8.3	37,508,700	21.7
MD	$20,647,401	7.2	719,533	21.5
VA	$20,504,034	5.6	892,717	18.8
2015				
Alt B	$18,504,010	8.4	487,352	18.9
Alt C	$21,623,797	7.8	580,835	18.5
Alt D	$30,753,203	8.7	759,632	19.9
US	$1,350,318,000	9.2	40,907,800	22.0
MD	$24,656,992	7.6	798,345	22.6
VA	$27,797,639	6.6	964,899	19.5

Source: U.S. Department of Commerce, Bureau of Economic Analysis,
Regional Economic Information System

The percentage of proprietor's income in Alternative B's Study Area is lower than the US, but higher than in Virginia and Maryland.

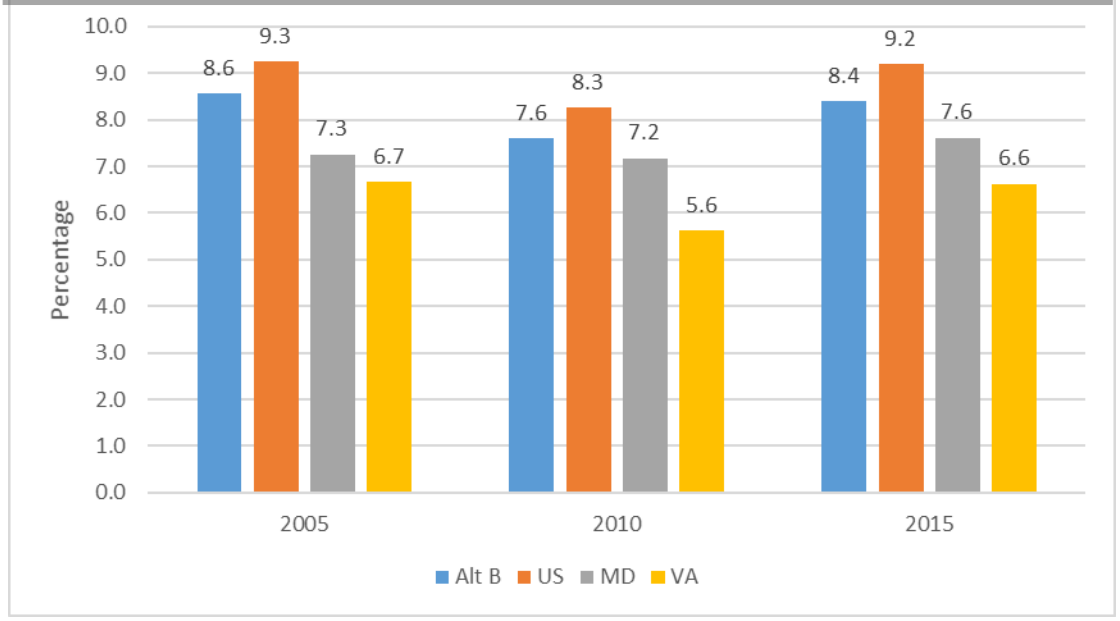
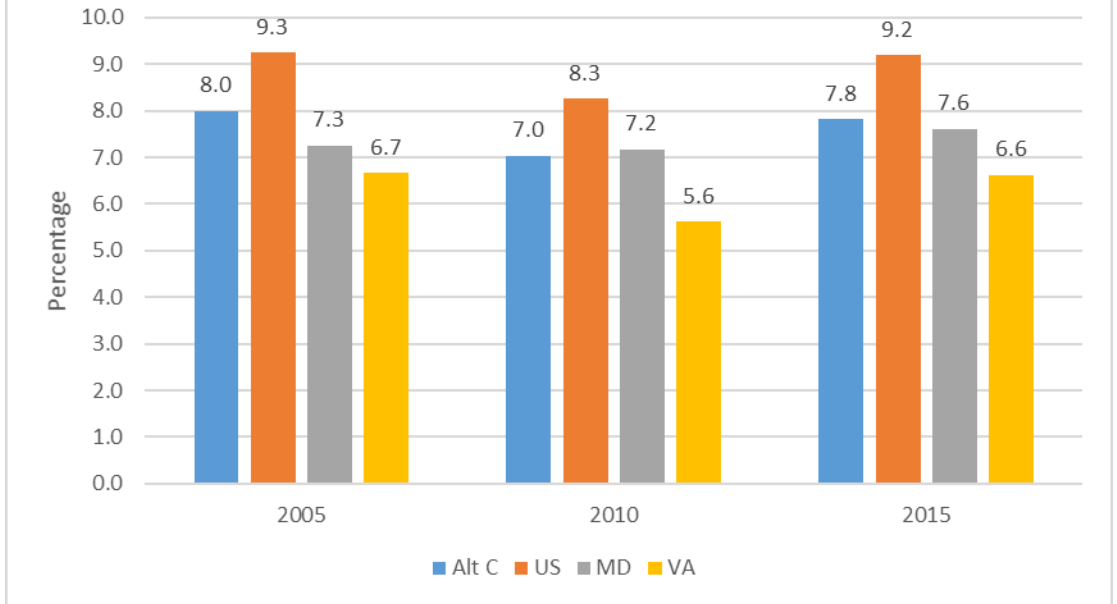


Figure 3.10 Alternative B's Study Area, Proprietor's Income as a Percentage of Total Income

The percentage of proprietor's income in Alternative C's Study Area is lower than the US, but higher than in Virginia.



The percentage of proprietor's income in Alternative D's Study Area is lower than the US, but higher than in Virginia and Maryland.

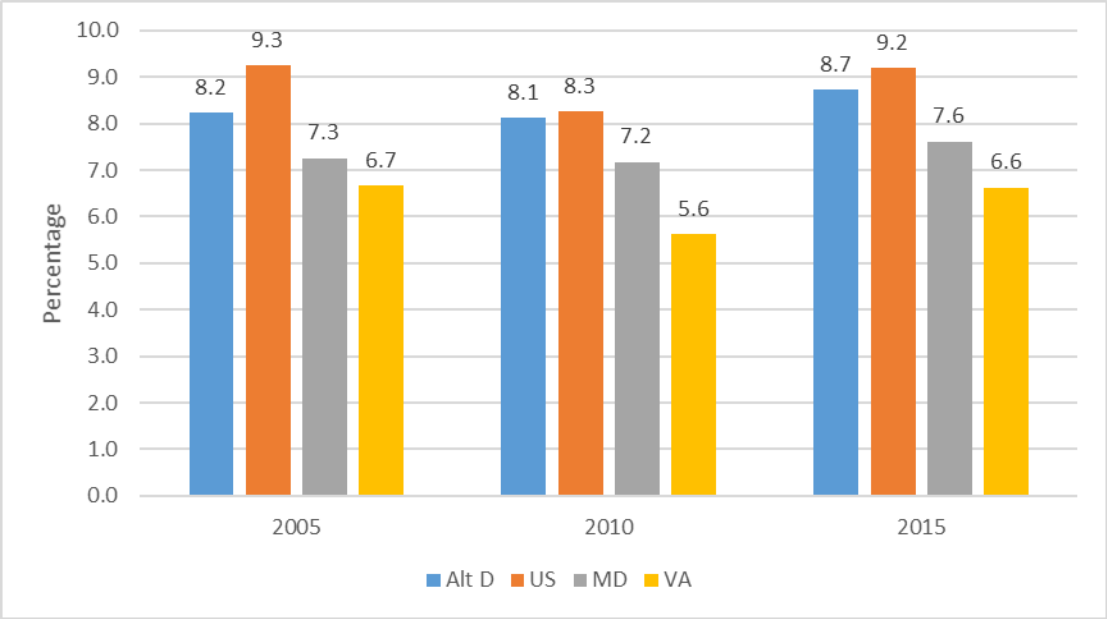


Figure 3.12 Alternative D's Study Area, Proprietor's Income as a Percentage of Total Income

The percentage of proprietor's employment in Alternative B's Study Area is lower than the US, Maryland and Virginia.

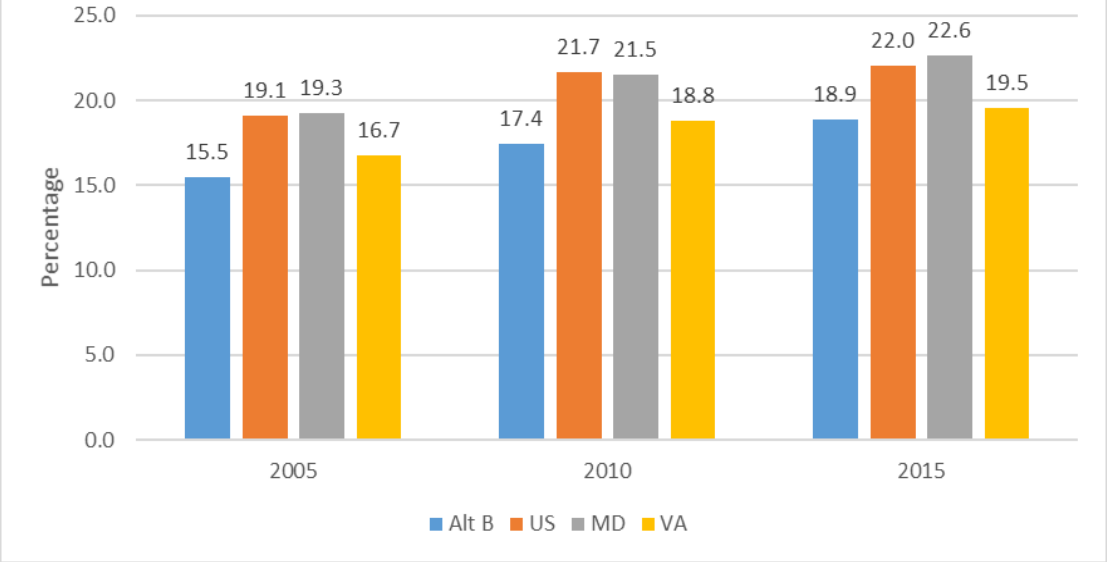


Figure 3.13 Alternative B's Study Area, Proprietor's Employment as a Percentage of Total Employment

The percentage of proprietor's employment in Alternative C's Study Area is lower than the US, Maryland and Virginia.

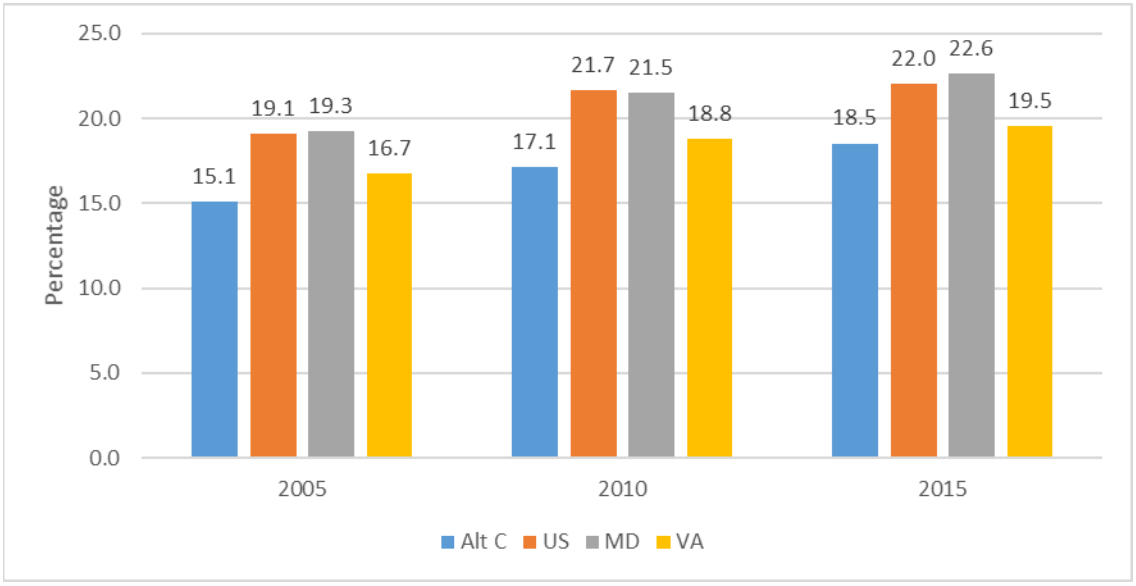


Figure 3.14 Alternative C's Study Area, Proprietor's Employment as a Percentage of Total Employment

The percentage of proprietor's employment in Alternative D's Study Area is lower than the US and Maryland.

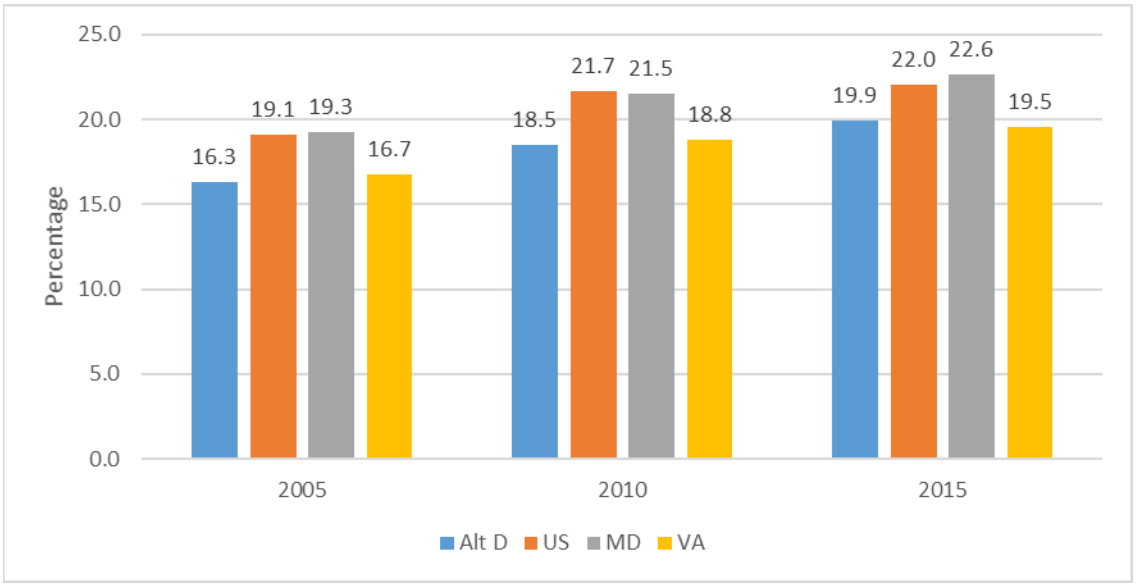


Figure 3.15 Alternative D's Study Area, Proprietor's Employment as a Percentage of Total Employment

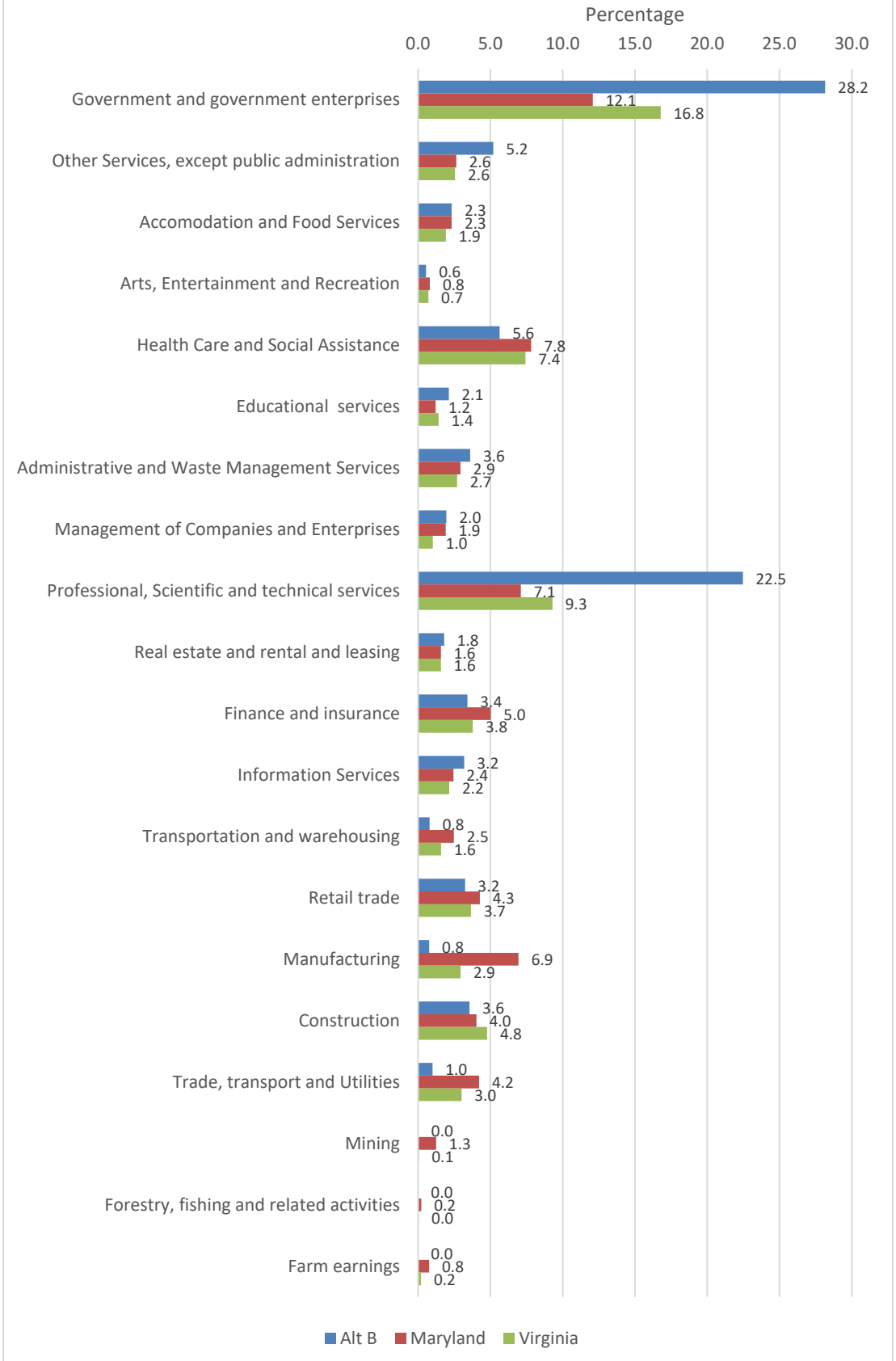
Personal Income and Employment by Industry Sector

The U.S. Department of Commerce, Bureau of Economic Analysis (BEA) in its Regional Economic Information System reports income and employment for different geographic areas by industry or economic sector using North American Industry Classification System (NAICS) industry classification codes. The NAICS codes identify different sectors of the economy using up to four digits. The higher the number within a sector the more specific the industry. For example, "retail trade" is the 700 series. So at the 700 level, all retail trade is included. Code 701 is "Motor Vehicle and parts dealers" and 702 is "Furniture and home furnishing stores". For the counties in our study area, we only report at the highest level i.e. for each series only the "00" level of detail. Even here, for some counties within the study area, the information is classified as "D" for non-disclosure meaning the numbers cannot be reported because there are less than 10 firms in that industry or economic sector. It is possible to request a special run by BEA for the study area totals when there is more than one county with non-disclosure for a particular sector. We have not done that here.

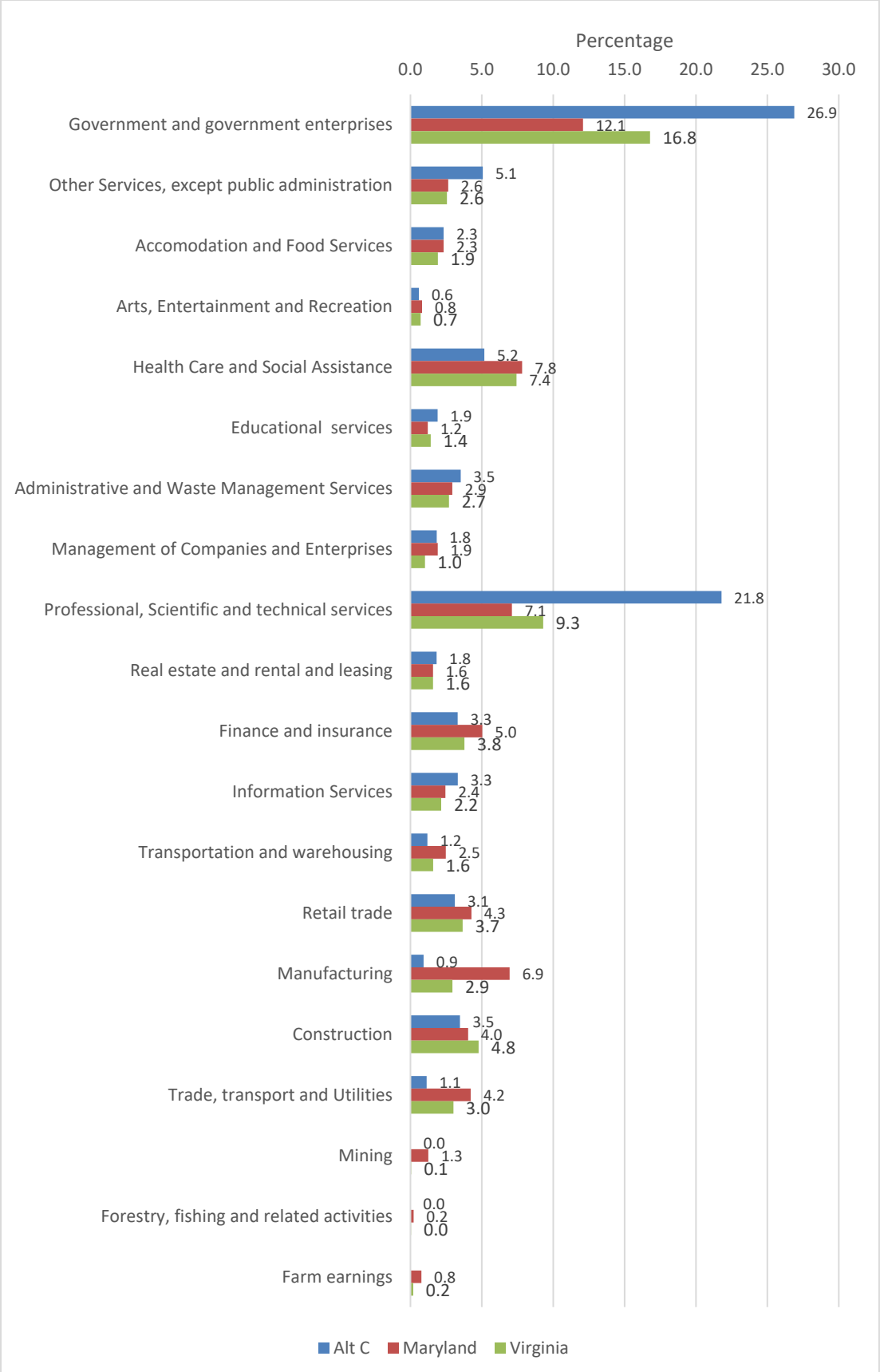
Personal Income by Industry

In 2015, Alternative B's study area had higher proportions of its personal income generated in "Government and government enterprises", "Other services, except public administration", "Administrative and waste management services", "Management of companies and enterprises", "Professional, scientific and technical services", "Real estate and leasing", and "Information services" than Maryland and Virginia. Alternative C's and D's study areas had higher proportions of its personal income generated in "Government and government enterprises", "Other services, except public administration", "Administrative and waste management services", "Professional, scientific and technical services", "Real estate and leasing", and "Information services" than Maryland and Virginia.

The study area of Alternative B has a higher percentage of “government and government enterprises” and “professional, scientific and technical services” than MD and VA.



The study area of Alternative C has a higher percentage of “government and government enterprises” and “professional, scientific and technical services” than MD and VA.


Percentage
0.0
5.0
10.0
15.0
20.0
25.0
30.0
Government and government enterprises
26.9
12.1
16.8
Other Services, except public administration
5.1
2.6
2.6
Accomodation and Food Services
2.3
2.3
1.9
Arts, Entertainment and Recreation
0.6
0.8
0.7
Health Care and Social Assistance
5.2
7.8
7.4
Educational services
1.9
1.2
1.4
Administrative and Waste Management Services
3.5
2.9
2.7
Management of Companies and Enterprises
1.8
1.9
1.0
Professional, Scientific and technical services
21.8
7.1
9.3
Real estate and rental and leasing
1.8
1.6
1.6
Finance and insurance
3.3
5.0
3.8
Information Services
3.3
2.4
2.2
Transportation and warehousing
1.2
2.5
1.6
Retail trade
3.1
4.3
3.7
Manufacturing
0.9
6.9
2.9
Construction
3.5
4.0
4.8
Trade, transport and Utilities
1.1
4.2
3.0
Mining
0.0
1.3
0.1
Forestry, fishing and related activities
0.0
0.2
0.0
Farm earnings
0.8
0.2
Alt C
Maryland
Virginia

The study area of Alternative D has a higher percentage of “government and government enterprises” and “professional, scientific and technical services” than MD and VA.

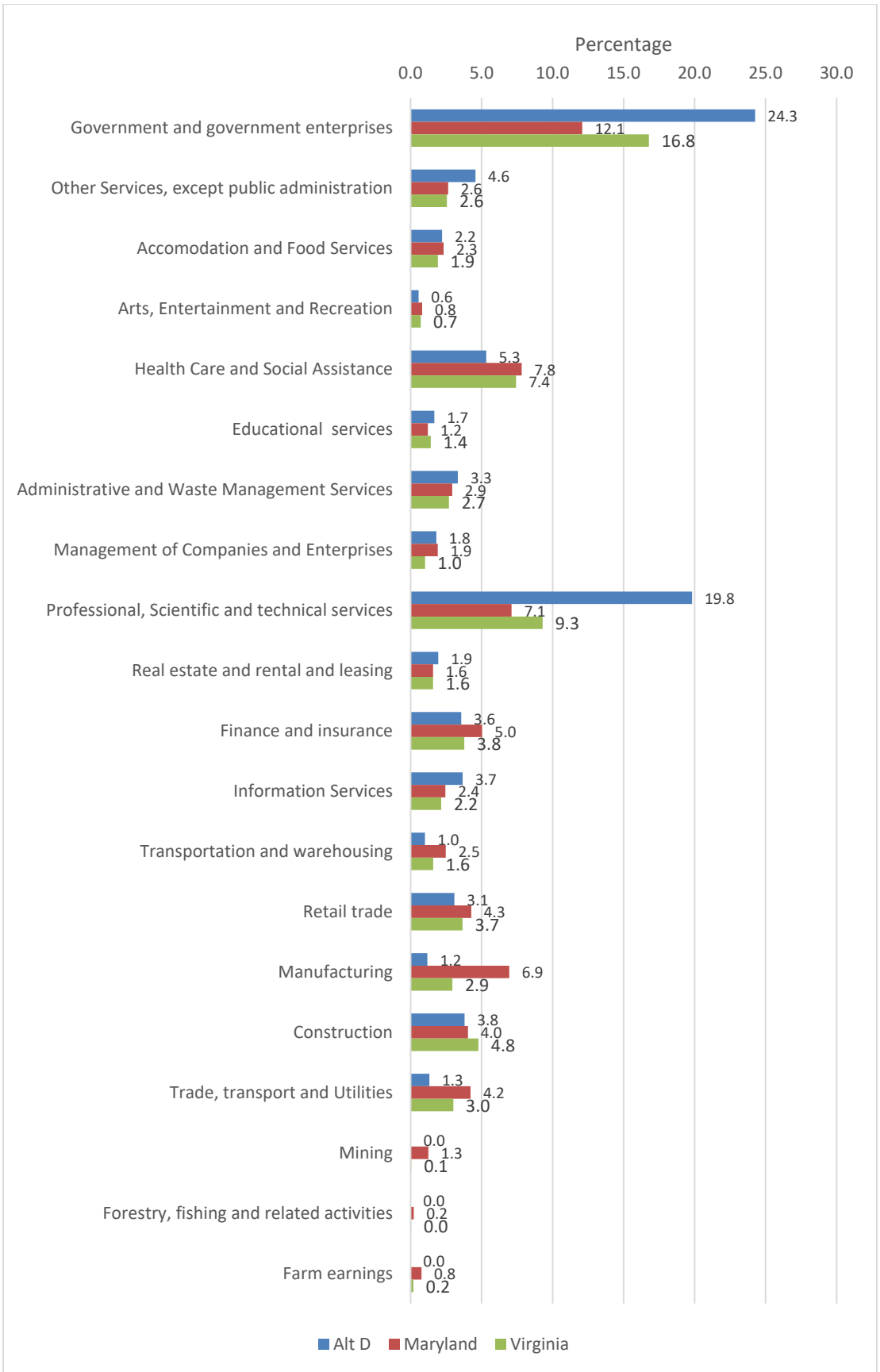

Percentage
0.0
5.0
10.0
15.0
20.0
25.0
30.0
Government and government enterprises
24.3
12.1
16.8
Other Services, except public administration
4.6
2.6
2.6
Accomodation and Food Services
2.2
2.3
1.9
Arts, Entertainment and Recreation
0.6
0.8
0.7
Health Care and Social Assistance
5.3
7.8
7.4
Educational services
1.7
1.2
1.4
Administrative and Waste Management Services
3.3
2.9
2.7
Management of Companies and Enterprises
1.8
1.9
1.0
Professional, Scientific and technical services
19.8
7.1
9.3
Real estate and rental and leasing
1.9
1.6
1.6
Finance and insurance
3.6
5.0
3.8
Information Services
3.7
2.4
2.2
Transportation and warehousing
1.0
2.5
1.6
Retail trade
3.1
4.3
3.7
Manufacturing
1.2
6.9
2.9
Construction
3.8
4.0
4.8
Trade, transport and Utilities
1.3
4.2
3.0
Mining
0.0
1.3
0.1
Forestry, fishing and related activities
0.0
0.2
0.0
Farm earnings
0.0
0.8
0.2
Alt D
Maryland
Virginia

Figure 3.18 Percent of Personal Income by Industry for Alternative D, 2015

Employment by Industry

In 2015, Alternative B's study area had higher proportions of its personal income generated in "Government and government enterprises", "Other services, except public administration", "Administrative and waste management services", "Management of companies and enterprises", "Educational services", "Professional, scientific and technical services", and "Information services" than Maryland and Virginia. Alternative C's and D's study areas had higher proportions of its personal income generated in "Government and government enterprises", "Other services, except public administration", "Administrative and waste management services", "Professional, scientific and technical services", "Real estate and leasing", and "Information services" than Maryland and Virginia.

The study area of Alternative B has a higher percentage of “government and government enterprises”, “educational services” and “professional, scientific and technical services” than MD and VA.

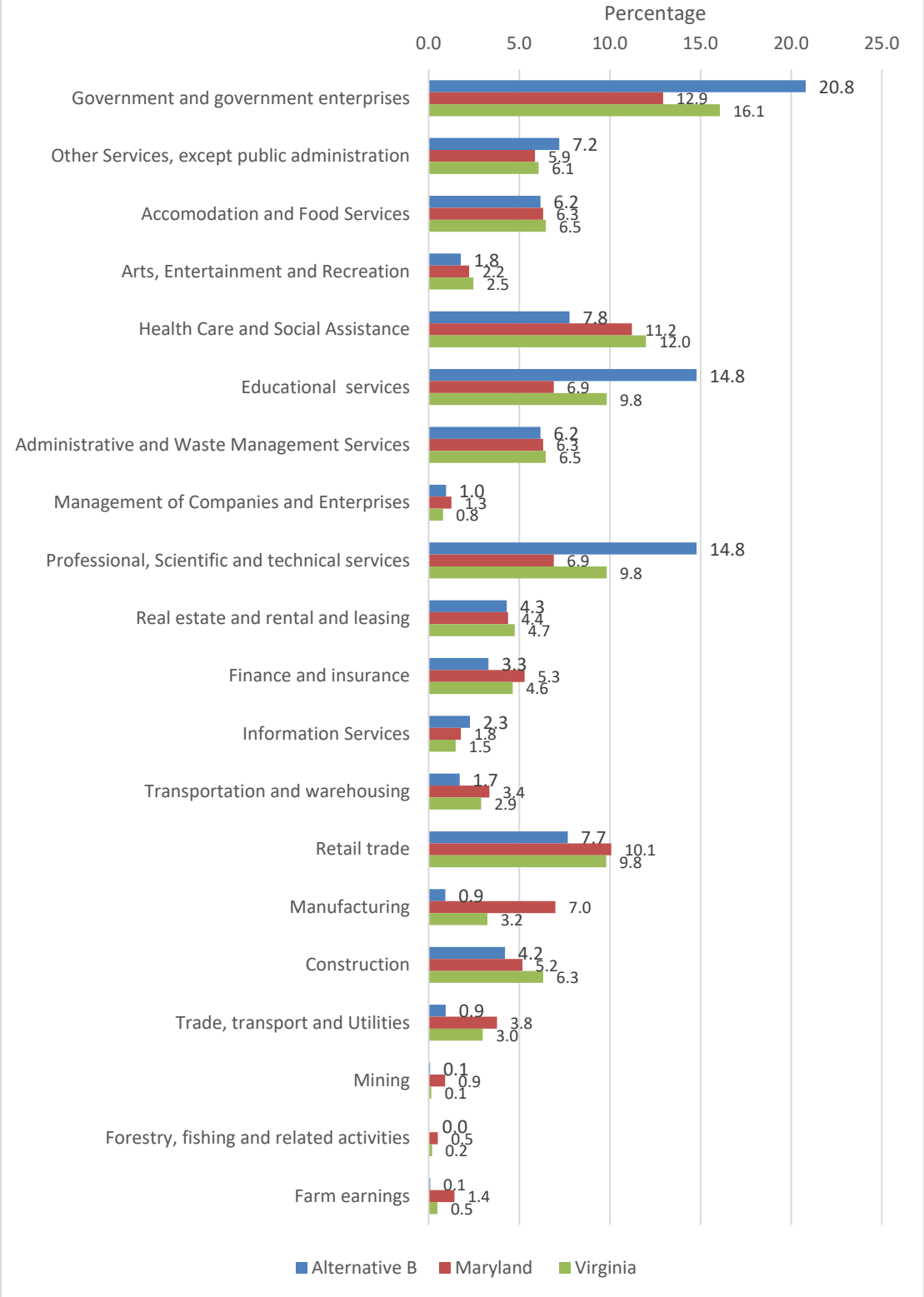


Figure 3.19 Percent of Personal Employment by Industry for Alternative B, 2015

The study area of Alternative C has a higher percentage of "government and government enterprises", "educational services" and "professional, scientific and technical services" than MD and VA.

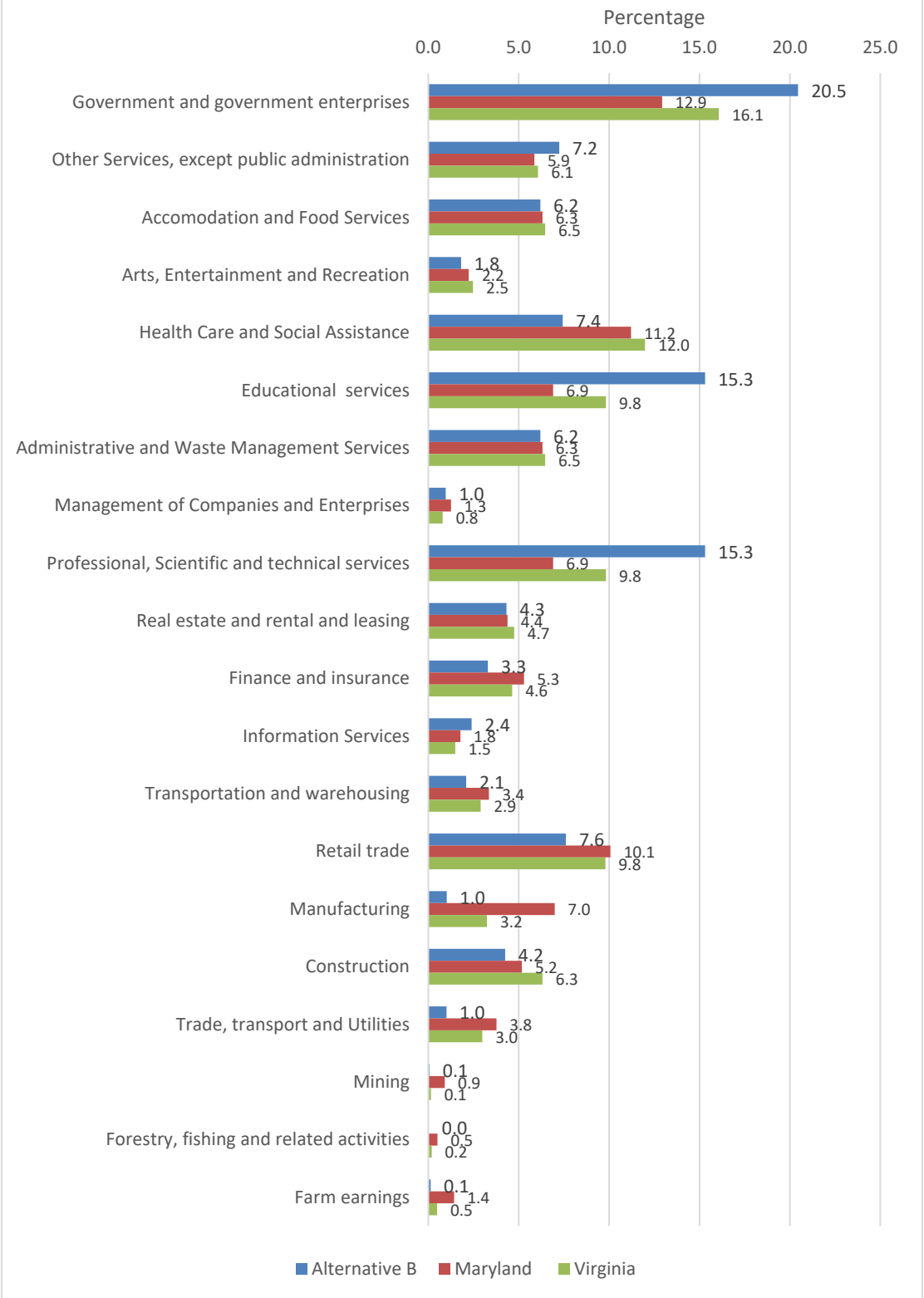


Figure 3.20 Percent of Personal Employment by Industry for Alternative C, 2015

The study area of Alternative D has a higher percentage of “government and government enterprises”, “educational services” and “professional, scientific and technical services” than MD and VA.

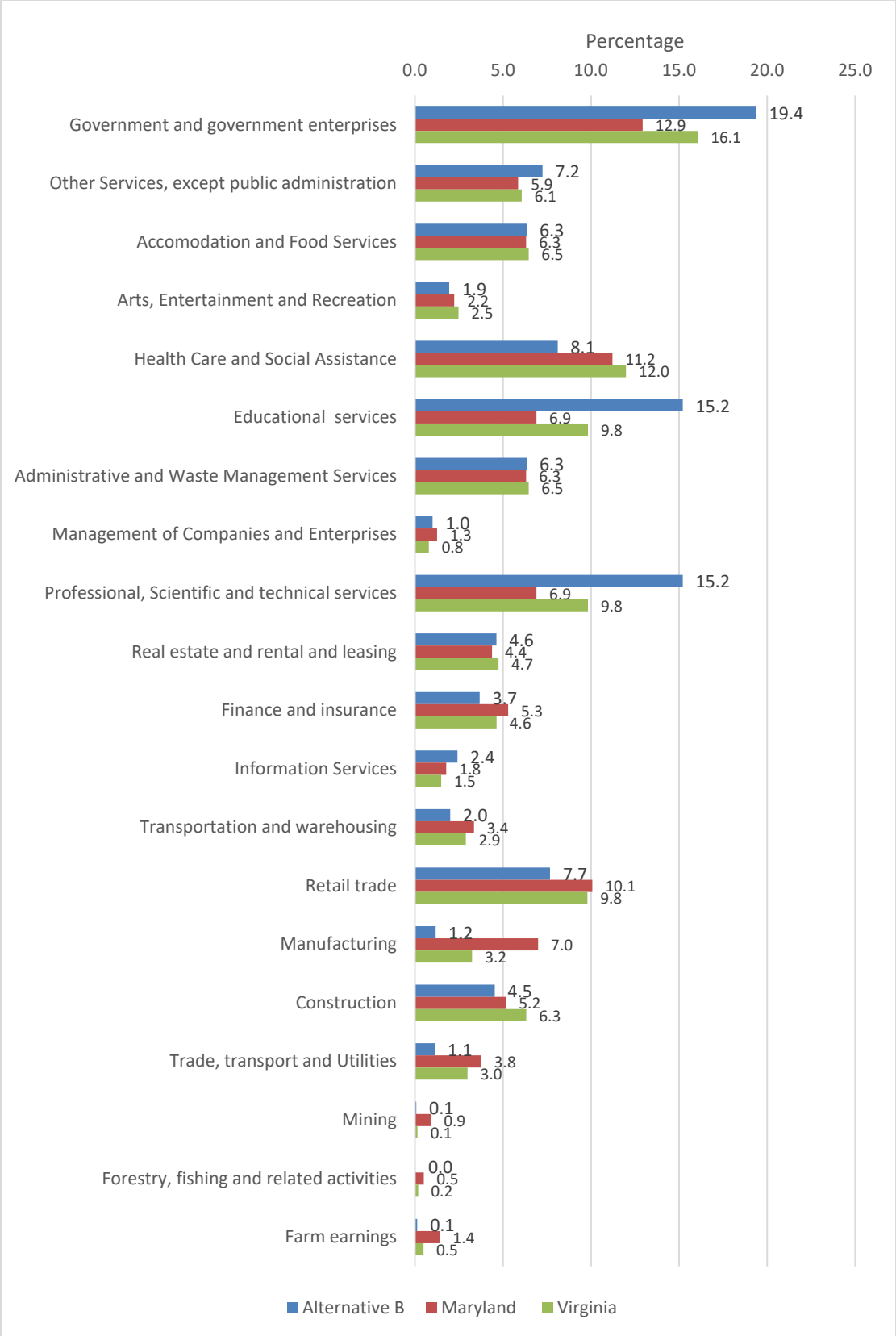


Figure 3.21 Percent of Personal Employment by Industry for Alternative D, 2015

4. Overview of Existing Recreation in Maryland and Virginia

A broader review of outdoor and recreational economies was completed by the Outdoor Industry Association. Economic benefits in Maryland of outdoor recreation results in $9.5 billion in consumer expenditures, 85,000 jobs, $2.8 billion in wages and $686 million in state and local tax revenue. In Virginia, the outdoor recreation results in $13.6 billion in consumer expenditures, 138,200 jobs, $3.9 billion in wages and $923 million in state and local tax revenue (OIA, 2016). In Maryland, additional revenues were generated from Vessel Excise Tax (on boats) and Sport Fishing Licenses. In 2013, these revenues totaled over $23 million (MD DNR, 2013). Although, Mallows Bay – Potomac River is small relative to the total outdoor recreational areas across the two states, the recreational activities that occur in the proposed sanctuary do contribute to the economy.

The Chesapeake Bay, located along the coasts of Maryland and Virginia, offer vast recreational opportunities to residents and visitors alike. In Virginia, more than 9 out of 10 respondents reported access to outdoor recreation as being 'very important' or 'important' (VDCR, 2012).

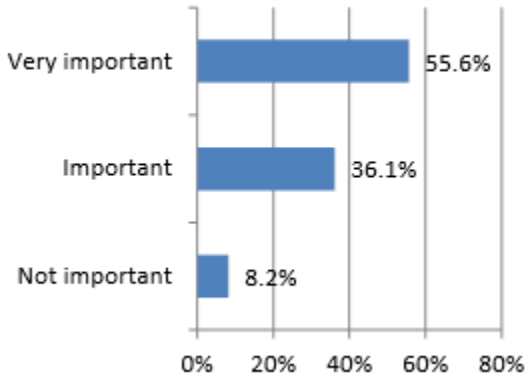


Figure 4.1 Importance of Access Outdoor Recreation Opportunities in Virginia
Source: http://www.dcr.virginia.gov/recreational-planning/document/vosexecsum11.pdf

The most popular activities in Virginia were walking for pleasure (82%), visiting historic sites (64%) and visiting parks (51%). The outdoor activities that Virginia residents engage in are listed below. However, the top two reasons residents do not use state parks are lack of personal, family time (40%) and lack of information (28%) (VDCR, 2012).

Table 4.1 Percentage of Virginia Households Participating in Outdoor Activities, 2011

Activities	Percent
Walking for pleasure	82.2%
Visiting historic sites	63.5%
Visiting parks (local, state, natl.)	50.6%
Visiting natural area/preserve/refuge	50.3%
Swimming/pool	43.1%
Sunbathing/relaxing on a beach	41.3%
Swimming/beach	38.3%
Jogging/running	33.6%
Using a playground	29.9%
Picnicking away from home	28.0%
Visiting gardens/arboretums	25.6%
Hiking/backpacking	24.8%
Fresh water fishing	24.4%
Camping	24.1%
Visiting natural preserves	19.4%
Golf	16.4%
Canoeing/kayaking/rowing	15.7%
Salt water fishing	14.0%
Off-road/multi-use bicycling	13.5%
Fitness Trail (not jogging)	12.7%
Basketball	12.6%
Hunting	12.6%
Soccer	11.8%
Downhill skiing/snow boarding	10.9%
Tennis	10.3%
Power boating	10.1%
Single track bicycling	10.0%
Snow sledding/tubing	9.1%
Nature study/Nature programs	8.8%

Source: http://www.dcr.virginia.gov/recreational-planning/document/vosexecsum11.pdf

A survey conducted in 2013 found that 80% of Maryland respondents thought that the availability of parks, trails, outdoor recreation facilities and outdoor education programs are ‘important’ or ‘extremely important’ (MD DNR, 2013).

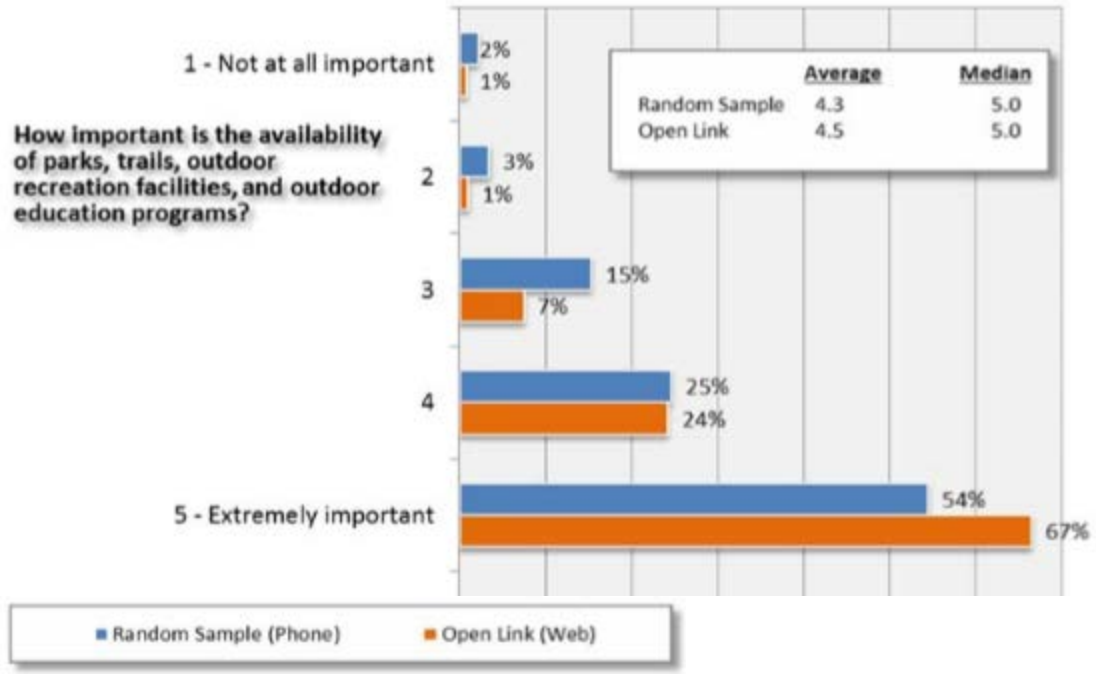


Figure 4.2 Importance of parks and trails in Maryland
Source: http://dnr.maryland.gov/land/Documents/LPRP/LPRP_%202014-2018.pdf

The most popular outdoor activities in Maryland are walking and visiting historical sites (75%), followed by picnicking (65%) and visiting natural areas (59%).

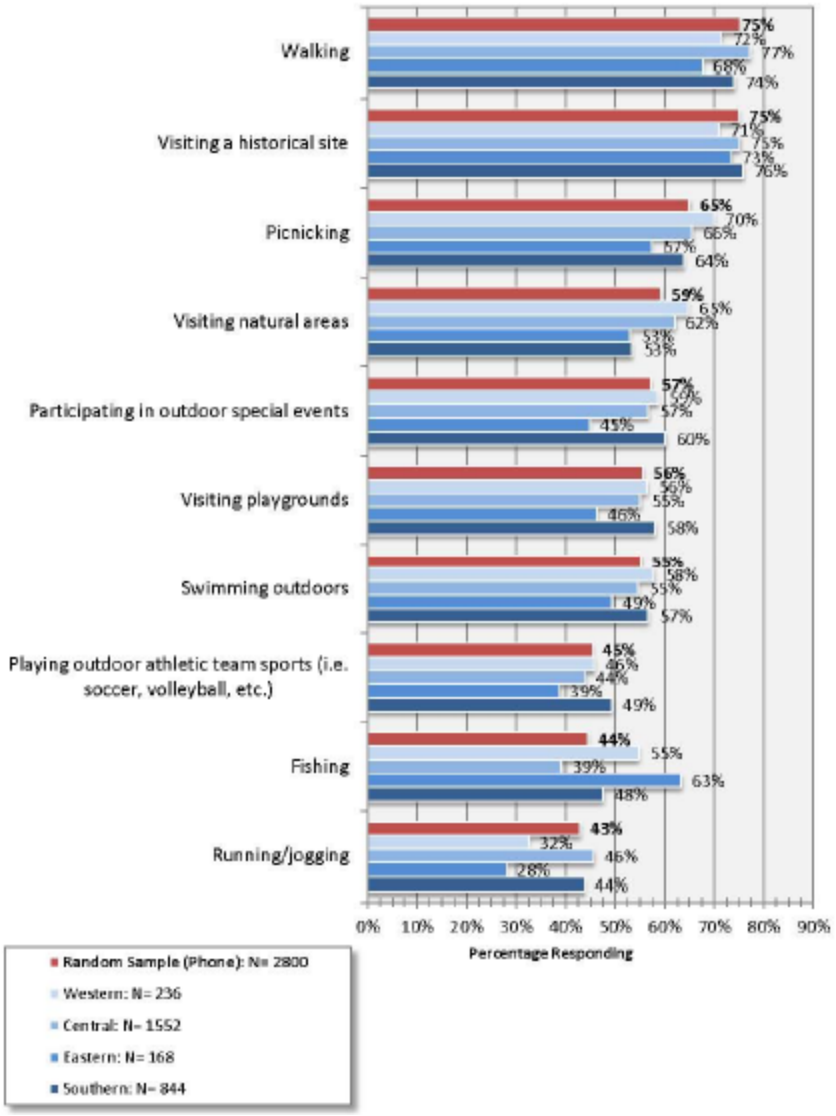


Figure 4.3 Top ten outdoor activities in Maryland by region
Source: http://dnr.maryland.gov/land/Documents/LPRP/LPRP_%202014-2018.pdf

The interest in historical areas shown by both Maryland and Virginia demonstrate that there are opportunities for the proposed sanctuary to utilize education and outreach to expand interest and knowledge of the cultural and historical site. Although exact numbers are not known at this time, recreational fishing, kayaking, hiking, wildlife viewing and class trips to the proposed sanctuary already occur.

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