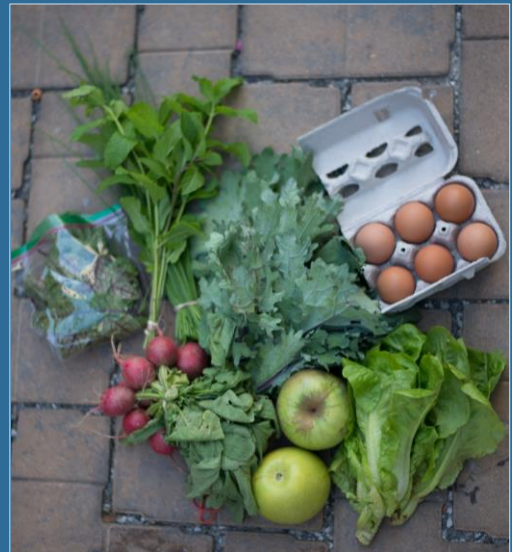


WHAT OUR REGION GROWS

To Eat and Drink

Agriculture's Past, Present, and Future in and around the
Metropolitan Washington Region

January 2019



Metropolitan Washington
Council of Governments

WHAT OUR REGION GROWS TO EAT AND DRINK

Prepared by the Metropolitan Washington Council of Governments' Regional Agricultural Work Group

Published January 2019

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The Metropolitan Washington Council of Governments (COG) is an independent, nonprofit association that brings area leaders together to address major regional issues in the District of Columbia, suburban Maryland, and Northern Virginia. COG's membership is comprised of 300 elected officials from 24 local governments, the Maryland and Virginia state legislatures, and U.S. Congress.

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EXECUTIVE SUMMARY

Metropolitan Washington is a diverse region of more than five million people and one of the nation's largest economies. More than a million new residents and jobs are forecast between now and 2045. New residents may be surprised to learn that the region also has a rich agricultural economy that provides products locally and beyond.

Agriculture employed 65,000 Marylanders and 334,000 Virginians and generated statewide economic impacts of \$15.8 and \$70 billion dollars in 2015.

Agriculture is a significant economic sector. In 2012, it generated about \$760 million in crop and livestock sales in the **Washington Agricultural Region**.¹ As an industry, in 2015 it employed 65,000 Marylanders and 334,000 Virginians and generated statewide economic impacts of \$15.8 and \$70 billion dollars respectively.^{2,3}

Preliminary data on the size of the District of Columbia's food economy put its value-added economic impact at \$5.5 billion, employing 82,000 workers (largely in restaurant and hospitality) and comprising 9.2% of the District's labor force.

Despite its contributions to jobs and economic growth, agriculture in this region faces challenges that discourage and threaten the future viability of certain sub-sectors, such as medium-scale fresh produce production and the dairy industry. This report provides a comprehensive look at agriculture in the region, and offers recommendations to preserve and strengthen it.

As part of its Region Forward Vision, the Metropolitan Washington Council of Governments (COG) set a goal to maintain 498,946 acres of land in farms. As of 2012, the region had 502,557 acres of

Land in farms has been declining steadily since World War II. COG's Region Forward goal is to maintain 498,946 acres of land in farms. As of 2012, the COG region was just 3,600 acres above this goal. Urgent, informed action is critical to ensure the region's agricultural future.

land in farms—just 3,600 acres above the goal. The region's progress against this goal will be reassessed with information from the 2017 Census of Agriculture, which will be available later in 2019. If past trends continue, however, the region is likely to drop below the goal.

As the region plans for new growth, addressing the needs of agriculture is critical to sustaining viable farm businesses, creating opportunities for new farmers, and reaping the benefits that the sector provides like jobs, local food, environmental services, open space, recreational opportunities, and more.

The region's food system is local, regional, national and global. Agricultural production in the region does not fulfill food demand from the region's residents. The degree of the region's self-reliance on

¹ The approximately 8,600 square mile area in and around the District of Columbia, comprised of the following counties and jurisdictions – **Maryland:** Anne Arundel, Calvert, Carroll, Charles, Frederick, Howard, Montgomery, Prince George's, St. Mary's, and Washington; **Virginia:** Arlington, Clarke, Culpeper, Fairfax, Fauquier, King George, Loudoun, Prince William, Rappahannock, and Stafford; **West Virginia:** Jefferson; **District of Columbia.**

² Maryland economic impact figure includes crop production, animal production and processing, commercial hunting and trapping, and other industries that rely on this sector for supply-chain inputs. Equine is also included. Seafood and aquaculture are reported separately in terms of economic contribution and jobs (3,341). Provided by Memo Diriker, Sarah Guy, and Dustin Chambers, "The Impact of Resource Based Industries on the Maryland Economy"

³ Diriker, Guy, and Chambers, "The Impact of Resource Based Industries on the Maryland Economy"; Rephann, "The Economic Impact of Virginia's Agriculture and Forest Industries."

its own production to meet estimated consumption continues to decline due to increasing population and decreasing farm production. (Table 1)

Table 1. Food Production and Demand in Washington Ag Region (2012)

Food Product	Production (acres or animals)	Demand (acres or animals)	Percent Demand Fulfilled	Surplus/Deficit (acres or animals)
Apples	1,778	18,655	10%	-16,877
Blueberries	56	3,101	2%	-3,045
Strawberries	34	12,896	0%	-12,862
Beans	2,323	11,365	20%	-9,042
Potatoes	181	28,533	1%	-28,352
Pumpkins	588	3,167	19%	-2,579
Squash	91	3,404	3%	-3,313
Sweet Corn	1,346	24,106	6%	-22,760
Tomatoes	444	35,615	1%	-35,171
Wheat	63,079	238,021	27%	-174,942
Corn ⁴	169,121	36,564	463%	132,557
Beef	119,166	722,321	16%	-603,155
Chicken	65,357	74,169,582	0%	-74,104,225
Pork	36,966	1,905,264	2%	-1,868,298
Dairy	44,041	235,067	19%	-191,026

Sources: U.S. Census, USDA NASS Census of Agriculture, USDA ERS Food Availability data, and others. Complete methodology and data sources is found in Appendix A.

In 2012, COG's **Regional Agricultural Work Group** published its first *What Our Region Grows* report. The report used the most recent agricultural information available from the 2007 Census of Agriculture (Census of Ag).

⁴ The values for corn are based on the per capita consumption of corn for grain used for direct human consumption, not for animal feed. Products include corn flour, corn meal, hominy and grits, and corn starch.

The Regional Agricultural Work Group (Ag Work Group) understood that the region's **foodshed**⁵ is larger than the COG membership region and provided data for the larger, Washington Agricultural Region (Washington Ag Region).

This update provides new measures and information on the Washington Ag Region's farms, farmers, and agricultural production. It primarily uses 2012 Census of Ag data. In some cases, the data is also provided for the COG Region and the larger Mid-Atlantic.

Even though this information is dated, it is important to benchmark the changes that are taking place to provide an update on agriculture in the region.

COG members may want to reassess the geographic extent of the foodshed in the future, given growing efforts to develop regional supply chains which extend beyond the boundaries of the Washington Ag Region.

Table 2. Urban Agriculture in the COG Region (2018)

Indicator	Total
Farmers Markets	154
Community Gardens	178
School Gardens	238
Urban Farms	25
Community Supported Agriculture Farms (CSAs)	68

A new and expanded Local Experiences section in this report contains 2012 Census of Ag data on agricultural production in every COG jurisdiction, along with more current state and locally collected data on the economic impact of agriculture, preserved lands, the craft beverage industry, urban agriculture (i.e. farms, community and school gardens, farmers markets, etc.).

The equine, horticulture, and landscaping industries are also integral parts of the region's agricultural economy. These industries use some of the same support services as farmers and ranchers growing and raising food for animals and people, such as large animal veterinarians and farm supply stores. The Local Experiences section also includes some information on these industries.

Agriculture is a dynamic industry. Today, some sectors are facing tremendous pressure regionally and nationally, not the least of which is the dairy industry. Simultaneously, new enterprises are opening their doors, like farm-based craft beverage businesses. Agritourism experiences and sales are on the rise. Urban farming is also growing, and there are new operations taking advantage of rooftops, buildings, and other nontraditional spaces for food production. A lot has changed since 2012 and the 2017 Census of Ag data will help quantify this further soon.

Major Themes and Trends

FARMING IS A CRITICAL AND DIFFICULT BUSINESS

Farming can seem like an ideal profession for some from the outside; however, farms are businesses that face some of the same challenges other businesses do. Every day, farmers must make complex short and long-term decisions and contend with swings in commodity prices, rapidly

⁵ A foodshed is the geography between where food is produced and is consumed. Conceptually, it is a relationship, similar to a watershed where instead of describing the flow of water, the flow of food origin to a particular population is described. The term is often used when describing the regional food production supporting a local or regional population.

changing market conditions, inappropriately scaled infrastructure, unpredictable weather, and more. These challenges make farming a low-margin and high-risk business.

THE FARM LANDSCAPE IS CHANGING RAPIDLY

The number of farms and farm acreage continues to decline in the Washington Ag Region. Farm size, pasture, and cropland coverage on farms are also changing. Today, there are more large farms and many more small farms than just two decades ago. This polarization has consequences for the region's ability to supply its own food. At the same time, according to local data, urban agriculture operations are growing. While this is important for many reasons, urban agriculture operations should not be expected to compensate for losses elsewhere in the region.

RISE IN AGRITOURISM AND CRAFT BEVERAGE

While food production in the region is declining, farmers and rural business owners are turning to other ways to keep land in agriculture. Craft beverage, including on-farm enterprises and a variety of forms of agritourism, have grown in the Washington Ag Region.

DECLINE IN FOOD PRODUCTION, REGIONAL SELF-RELIANCE, AND RESILIENCE

In the Washington Ag Region, food production is declining across major crops and livestock. For the basket of products that this report tracks, most have declined between 30 percent and 85 percent. These declining trends present two important and related issues for the region's communities. The first is to determine how to support the future success of agriculture and its diverse sectors. The second is how effectively work toward a more self-reliant and resilient food system. The findings and recommendations in this report suggest that supporting agriculture has economic, social, health, and food security benefits.

GROWING THE NEXT GENERATION OF FARMERS IS AN URGENT CHALLENGE

Will there be enough farmers in the next generation to keep land in agriculture and to produce food for the region? The farm population is aging, with the average age rising from 54.1 in 2002 to 59.2 years old in 2012.

Farm transition and farm viability issues are major concerns, and there remain significant barriers for entry into farming for new farmers, including for women and minority farmers who are underrepresented in the profession.

LOCAL INVESTMENT IN FOOD AND AGRICULTURAL ECONOMIC DEVELOPMENT

COG's Regional Agricultural Work Group has noted positive, modest public investment in agricultural economic development at the local level. Food policy councils are also increasing in the region, and several COG member jurisdictions have also hired farm-to-school coordinators to improve connections between farmers and schools and to support garden-based education. Several Ag Work Group members report that staffing for university extension seems to be rebounding to pre-recession levels, though not in every jurisdiction in the Washington Ag Region. Public investment in direct technical assistance is also critical, as farmers and ranchers are impacted by a host of evolving policy and regulatory issues (e.g. new food safety regulations) and changing growing conditions.

CAPITALIZING ON UNPRECEDENTED INTEREST IN LOCAL FOOD

Better information and regular regional collaboration around issues such as agricultural land use, land preservation, transportation, supply chain infrastructure, and market access are required to capitalize on the increasing interest in local food and to plan for a more resilient future. Stabilizing the agricultural land base is of utmost urgency if the region aspires to maintain agriculture in its economic future. Healthy soil is a critical investment for farmers. It is also increasingly being studied

as a potential carbon sink. The Sacramento Area Council of Governments' Rural-Urban Land Use Connections Program provides one example for how councils of government can leverage data to help members plan for vibrant, rural economies.

Recommendations

The report concludes with several key recommendations for preserving and strengthening agriculture in the region. These include:

Creating a Regional Committee on Food and Agriculture at COG. Currently, metropolitan Washington lacks an institutionalized, regional body to take coordinated action to strengthen the region's food and farm economy.

Co-Hosting Regional Forums on Farm Viability, Land Preservation, and Next Generation Farmers in the Washington Agricultural Region. These are among the most pressing issues facing the region's rapidly changing agricultural economy.

Commissioning and Implementing a Strategic Plan for Agriculture. A plan is needed to address persistent and new challenges within the sector, and to help position it to capitalize on new opportunities.

Funding Agricultural-Related Technical, Educational, and Marketing Services at the County-Level. For agriculture to continue to make a significant economic impact in the region, contribute to quality of life and a healthier environment, a range of support is required.

Making Continued improvements in State and Local Policies and Regulations to Support Diversification of Farm Activity. As agriculture and consumer preferences continue to evolve, state and local governments should work with farmers and communities to permit new types of entrepreneurship that can contribute to a healthy bottom line.

Incentivizing Local Food Aggregation, Processing, Distribution, and Purchasing. A range of steps will be needed to increase regional self-reliance and resilience, such as developing stronger markets for local and regional food and farm products.

More detail on each of these recommendations can be found on page 81.

INTRODUCTION

Interest in food and agriculture is at an all-time high and it is important to understand how trends in the region are similar or different from national ones. *What Our Region Grows* provides the best information available to build a shared understanding of the state of the region's land, farms, farmers, and others engaged in the agricultural production of food. The hope is that this information will inspire new regional action on behalf of farmers, food businesses, and the communities they serve to address challenges and opportunities for shaping metropolitan Washington's agricultural future.

What's in This Report

This report provides a snapshot of the state of the region's agriculture. It discusses key trends, assesses food production and demand, and examines major industry challenges and opportunities. While the report primarily focuses on the Washington Ag Region, there is some examination of the broader **foodshed**. It includes U.S. Census of Agriculture data from 1997 to 2012 to provide a broader look at changes in production and farms over time.⁶ Additionally, this update uses a new methodology for estimating consumptive demand and **regional self-reliance** relative to production. Assumptions and the methodology underlying this analysis are provided in **Appendix A**.

Many COG members will be interested the **Local Agriculture Quick Facts** section, which highlights how the agricultural economy in COG's member jurisdictions is rapidly evolving. Although urban agriculture is growing in the region, a lack of standardized data limits regional analysis currently. Ultimately, *What Our Region Grows* provides recommendations for strengthening agriculture and the food economy.

While this report examines many topics, it does not address the seafood, forestry, horticulture for landscaping, or equine industries. Other studies cover these topics in depth at the state-level. Although these industries are not the focus of this report, they are very important to the agricultural economy. For instance, the equine industry in Maryland supports about \$1.15 billion in economic activity each year within the state.⁷ Similarly, Virginia's forestry sector contributed to over \$21 billion in total economic impact in 2015.⁸

The report also has very limited discussion of infrastructure and no examination of food access challenges. Food distribution, retail, and the restaurant industry are also not a focus. All



Commercial crabbing along the Potomac River. In addition to limited commercial fishing on the Potomac River there is a small number of aquaculture operations in the Washington Ag Region. (Potomac River Fisheries Commission)

⁶ The first version *What Our Region Grows* was published prior to the release of the 2012 Census of Agriculture data. The U.S. Department of Agriculture's National Agricultural Statistics Service, responsible for Census of Ag data collection and analysis, is currently analyzing data collected for the 2017 census. This updated data will be released sometime in early 2019.

⁷ Sage Policy Group, Inc., "Maryland's Horse Industry Turns a Corner."

⁸ Rephann, "The Economic Impact of Virginia's Agriculture and Forest Industries."

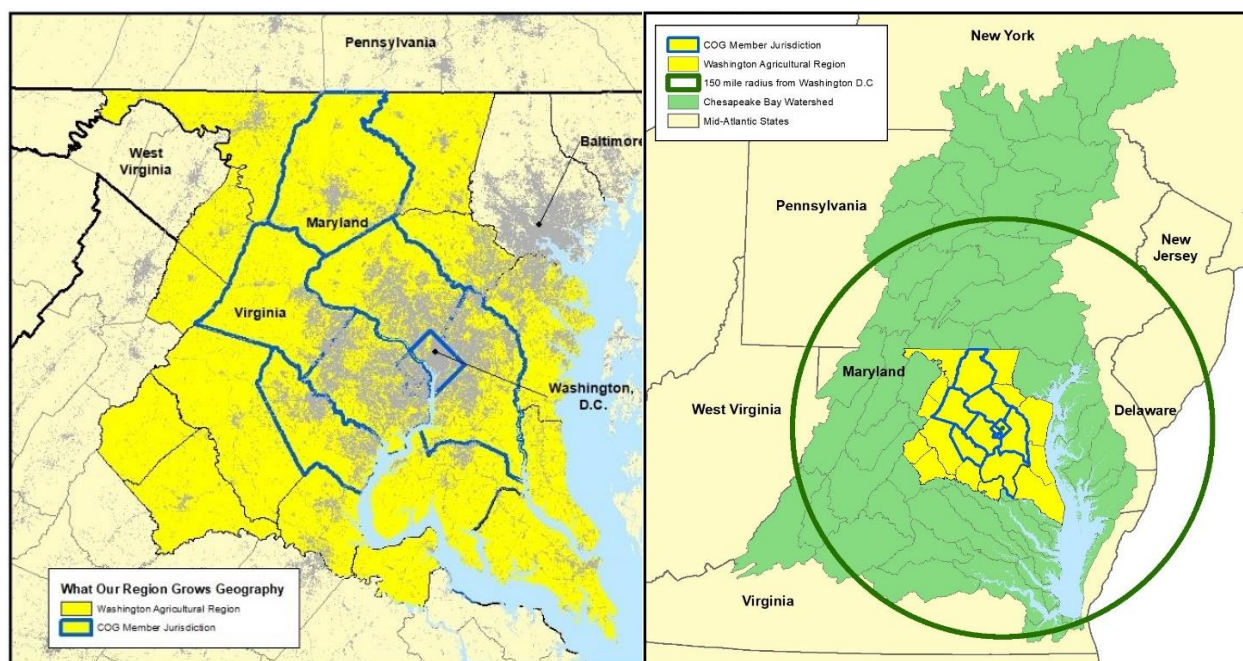
merit in-depth regional examination. Future updates could potentially capture a broader set of agricultural and supply chain activities.

Defining the Agricultural Region

Defining an agricultural region is a challenge. While foodsheds are not constrained by geopolitical boundaries, there are limits to a project's scope. In 2012, COG's Ag Work Group defined the foodshed to include jurisdictions beyond the **COG Region**. The resulting Washington Ag Region recognized a broader scope for assessing food production but kept a focus on neighboring COG jurisdictions. Since then, there has been a movement to define the foodshed by the boundaries of the **Chesapeake Bay watershed**.

This report looks at a variety of geographies and scales, but primarily focuses on the Washington Ag Region. Data from the U.S. Census of Agriculture for the COG Region can be provided upon request, while data for the Mid-Atlantic Region is provided in [Appendix C](#) to approximate the Chesapeake Bay watershed.⁹ In a few cases, the report references state-level data for Maryland and Virginia, especially where county-level data is unavailable.

Figure 1. The COG, Washington Ag, and Mid-Atlantic Regions



Right: Washington Ag Region (yellow) and COG members (blue outline). **Left:** The Washington Ag Region relative to the Chesapeake Bay and Mid-Atlantic.

The Washington Ag Region encompasses jurisdictions in Maryland, Virginia, West Virginia, and the District of Columbia. It covers over 8,600 square miles and was home to 7.1 million people in 2017. The region benefits from a favorable climate and varied topography, which allows for a rich bounty of agricultural products. These include award-winning wines and other craft beverages, high quality meats, fruits and vegetables, cut flowers, seafood, and other specialty products and services.

⁹ The U.S. Census of Agriculture is administered by the National Agricultural Statistics Service (NASS) in the U.S. Department of Agriculture (USDA). In 2012, NASS provided some data at the watershed level. [Learn more here.](#)

The region is also highly urban, which places limits on agricultural production through land use dynamics. While the Washington Ag Region produces a wide variety of food and fiber, most food products are imported from other places.

FARMS AND AGRICULTURAL LAND USE: A CHANGING LANDSCAPE

Agriculture continues to experience a great deal of change. The last twenty years saw continued declines in farms, farmland, and farmers. Population dynamics, development pressures, and changing consumer preferences have all impacted agriculture.

Today, the Washington Ag Region is dominated by small-scale diversified farms. These farms grow a diverse number of crops or are engaged in ag-related business activities other than crop production. The recognition that diversification is required to remain competitive has spurred businesses and policymakers to promote agritourism, craft beverage, and mid-scale aggregation.

Agriculture is undergoing tremendous changes but remains the #1 industry in Maryland and Virginia.

In urban communities, farmers markets, community gardens, urban farms, and school gardens are increasing. All are important for connecting people to agriculture.

Despite some of the concerning trends, agriculture remains a significant economic driver. Agriculture is the leading industry by employment in Maryland, Virginia, and other Chesapeake Bay states.

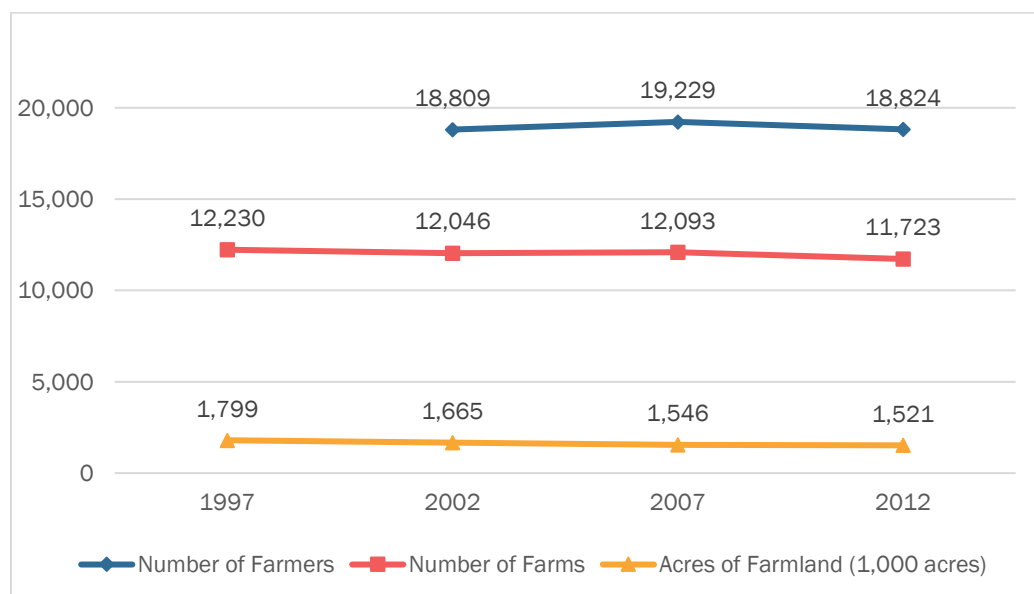


Although not included in this report, horses and the equine industry are a significant part of the Washington Ag Region's agricultural economy. Pictured here is a Fairfax County pasture with fencing for tree protection. (Northern Virginia Soil and Water Conservation District)

Declining Numbers of Farmers, Farms, and Farmland

Nationally, the number of farmers, farms, and farmland acreage has been declining over time with some stabilization in recent decades. This trend is consistent for the COG, Washington Ag, and Mid-Atlantic regions as well.

Figure 2. Washington Ag Region: Farmers, Farms, and Farmland



Source: USDA NASS Census of Agriculture

FEWER FARMERS

Since World War II, the U.S. has seen tremendous growth in population and continued decline in the farm population as more people continued to move to urban areas. The trend has been no different in the region. In 2012, farmers made up about 0.5 percent of the labor force in the Washington Ag Region, and this percentage was even lower in the COG Region. COG estimates that farmers represented about 16 percent of the labor force nationally in 1945. [Table 3](#) underscores the significance of this decline.

Table 3. Benchmarking Farmers against the Labor Force, 2012

2012	Total Population	Farmers	Total Labor Force ¹⁰	Farmers as % of Labor Force ¹¹
COG Region	5,001,712	7,334	2,806,693	0.26%
Washington Ag Region	6,713,928	18,824	3,730,655	0.50%
Mid-Atlantic Region	58,673,645	289,429	30,475,709	0.95%
United States	313,993,272	3,180,074	158,607,619	2.00%

Sources: USDA NASS Census of Agriculture 2012, 2012 ACS 1-year Estimates, and 2012 ACS 5-year Estimates.

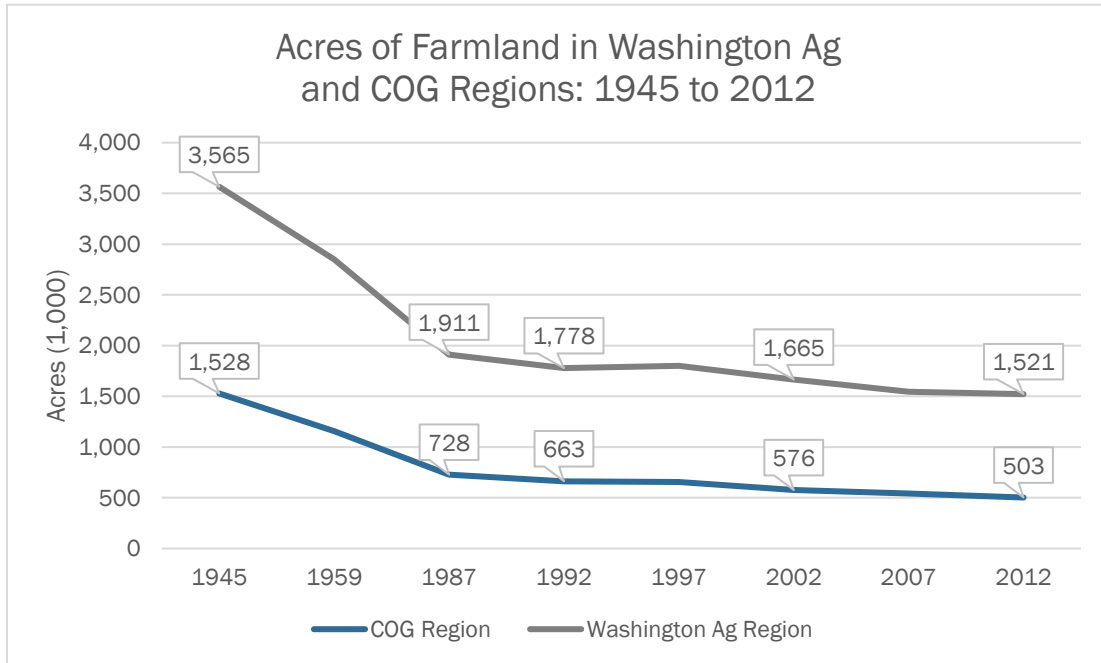
¹⁰ Labor force includes civilian labor force and those on active duty in the US Armed Forces. Civilian labor force consists of non-institutionalized civilians who are classified as either employed or unemployed. Also see [Not in Labor Force](#) in glossary.

¹¹ Other reports may report lower values if the calculation is based on farmer as a percentage of the population eligible for work (those ages 16 or older).

LESS FARMLAND

Farmland in the Washington Ag Region declined by 2 million acres since the 1945 Census of Ag; a 57 percent decline over nearly 70 years (Figure 3). The COG region saw a 67 percent decline over the same period, a loss of about 1 million acres. In other words, half of the acreage decline in the Washington Ag Region occurred in the COG Region, which has been rapidly urbanizing for decades.

Figure 3. Acres of Farmland in Washington Ag and COG Regions, 1945-2012



Source: USDA NASS Census of Agriculture

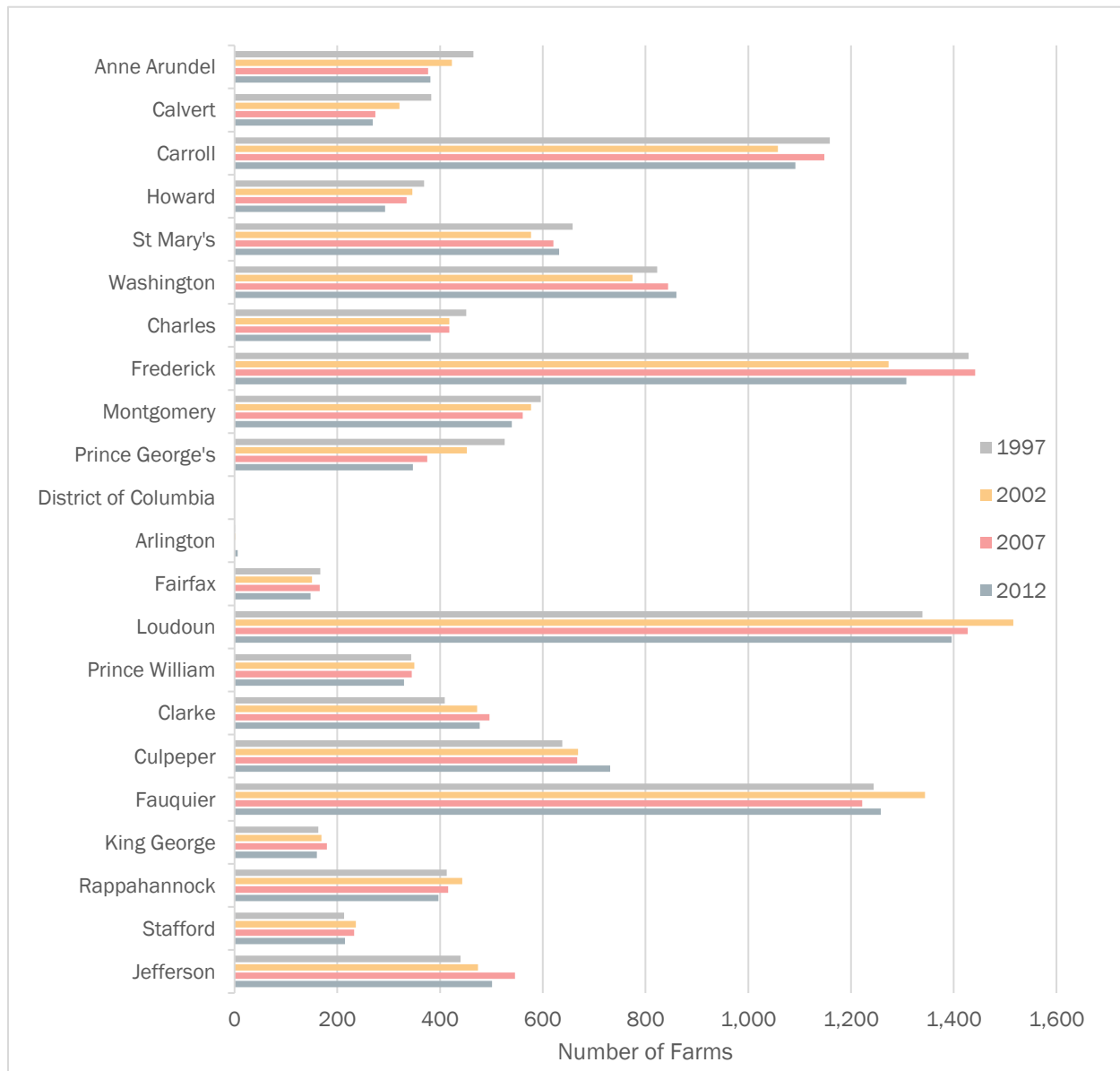
DECLINING FARM NUMBERS

The change in the number of farms from 1945 to 2012 has also been dramatic.¹² In 1945, there were 32,455 farms in the Washington Ag Region. Today there are fewer than 12,000 farms.

A look at county breakdowns reveals an interesting dynamic. While farms have been declining in most counties in the Washington Ag Region from 1997 to 2012, the declines are occurring more in Maryland than in Virginia. Nine out of 10 Maryland counties saw decreases in farm numbers during this period, whereas five out of 10 Virginia counties had declines.

¹² Please note that the definition of a farm changed in 1975. Thus, farm numbers prior to 1975 are not entirely comparable to the numbers afterwards.

Figure 4. Number of Farms in the Washington Ag Region, 1997-2012



Source: USDA NASS Census of Agriculture

These long-term declines in farmers, farmland, and farms can be problematic. Continued population growth and land development can widen mismatches in the supply and demand for affordable agricultural land. Older farmers currently dominate the farming population, and there may not be enough younger farmers positioned to take over the land that will soon be available. In the absence of strong farmland preservation programs, protections, and incentives, agricultural land may be sold for development rights and forever lost.

Land in Farms Approaching a Critical Threshold in COG Region

In 1950, about 1.6 million people called the communities that comprise the COG Region home and occupied about 455,000 dwellings. Today, from its inner core to outer suburbs, the region has more than five million residents. According to the latest regional cooperative forecast, the region is projected to add 1.5 million new residents in 640,000 households and 1.1 million jobs between now and 2045. Managing this change and enhancing the region's quality of life requires on-going collaboration.

COG's Region Forward vision focuses on creating a more prosperous, accessible, livable, and sustainable metropolitan Washington. As a part of this vision, members project that 65 percent of household growth and 76 percent of job growth will be concentrated in one of the region's 141 Activity Centers. These are areas designated for more concentrated growth around transportation hubs, employment centers, and other local assets.

Region Forward also calls for maintaining 498,946 of acres of land in farms.¹³ According to the 2012 Census of Ag, the region was 3,600 acres above this threshold. Sustained regional collaboration will be needed to monitor this goal and develop strategies to maintain as much land in farms as possible.

Table 4. Acres of Land in Farms in the COG Region by County¹⁴

	1987	1992	1997	2002	2007	2012
District of Columbia	-	-	-	-	-	-
Arlington County	-	-	-	-	36	36
Fairfax County	12,602	15,714	12,313	9,946	7,031	7,856
Loudoun County	206,601	195,476	184,988	164,753	142,452	134,792
Prince William County	36,926	32,973	35,936	32,549	32,816	35,638
Frederick County	236,350	222,768	215,927	195,827	202,087	181,512
Montgomery County	103,377	82,470	77,266	75,077	67,613	63,493
Prince George's County	62,308	54,459	47,572	45,462	37,005	32,607
Charles County	67,655	59,389	55,928	52,056	52,147	46,659
Total	725,819	663,249	629,930	575,670	541,151	502,557

Source: USDA NASS Census of Agriculture

Consideration should also be given to engaging neighboring jurisdictions in the Washington Ag Region and the Chesapeake Bay watershed. Disappearing agricultural lands in the Shenandoah Valley, Delmarva Peninsula, Virginia's Northern Neck, and central and southern Pennsylvania have important implications for the region's ability to supply food. Sharing information and best practices in land preservation on a more frequent basis will be critical to maintaining agriculture in the region and beyond.

¹³ When Region Forward was developed, it called for maintaining 450,000 acres of land in farms using 2007 Census of Ag data. At that time, Charles County was not a COG member. With Charles County's agricultural lands included, the Region Forward Coalition recently approved a revised measure, which is the reason for the increase.

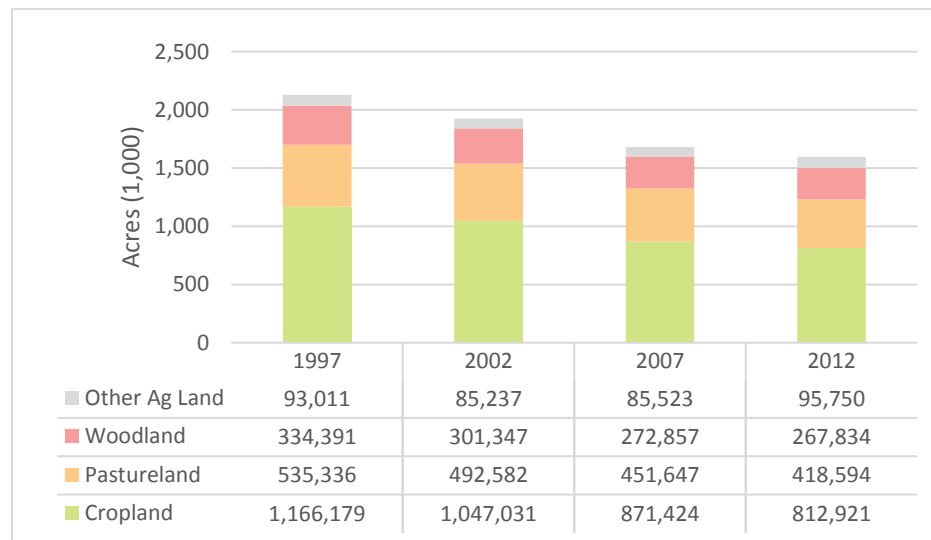
¹⁴ This data is from the U.S. Census of Agriculture. Although the District of Columbia does not have farmers completing the census, it has calculated the amount of land used for urban agriculture. In addition, Arlington County and COG staff do not believe there are 36 acres in farms in the county and have spoken with USDA National Agricultural Statistics Service about this.

CROPLAND AND PASTURE ON FARMS DECLINING AT GREATER RATES

The composition of agricultural lands has also changed. Working farms and ranches often contain more than cropland or pastureland, though there has been a strong trend toward specialization in agriculture in the last decades.

Declines in total agricultural land corresponds with declines in the land cover that many associate with farms. Most of the decline has occurred to pastureland and cropland, rather than woodland and other agricultural lands.¹⁵

Figure 5. Changes in Agricultural Land Composition in the Washington Ag Region since 1997



Source: USDA NASS Census of Agriculture

Between 1997 and 2012, cropland and pastureland in the more urban COG Region decreased at higher rates than in *non-COG counties* of the Washington Ag Region.

The decline in farmland acreage does not indicate the amount converted to other uses. Data from the National Resources Inventory tracks changes in land use *and* the sources of developed land. In the last 40 years, a significant amount of land was converted from the forestland, cropland, and pastureland in Maryland and Virginia. Since 1982, developed land has increased by 55 percent in Maryland which prime farmland has declined by 14 percent. In Virginia, developed land increased by 73 percent while prime farmland decreased by 8 percent.¹⁶

¹⁵ Other agricultural lands include area that is not considered land used for farming operations. Currently there is no data available that breaks down the specific land uses for this category.

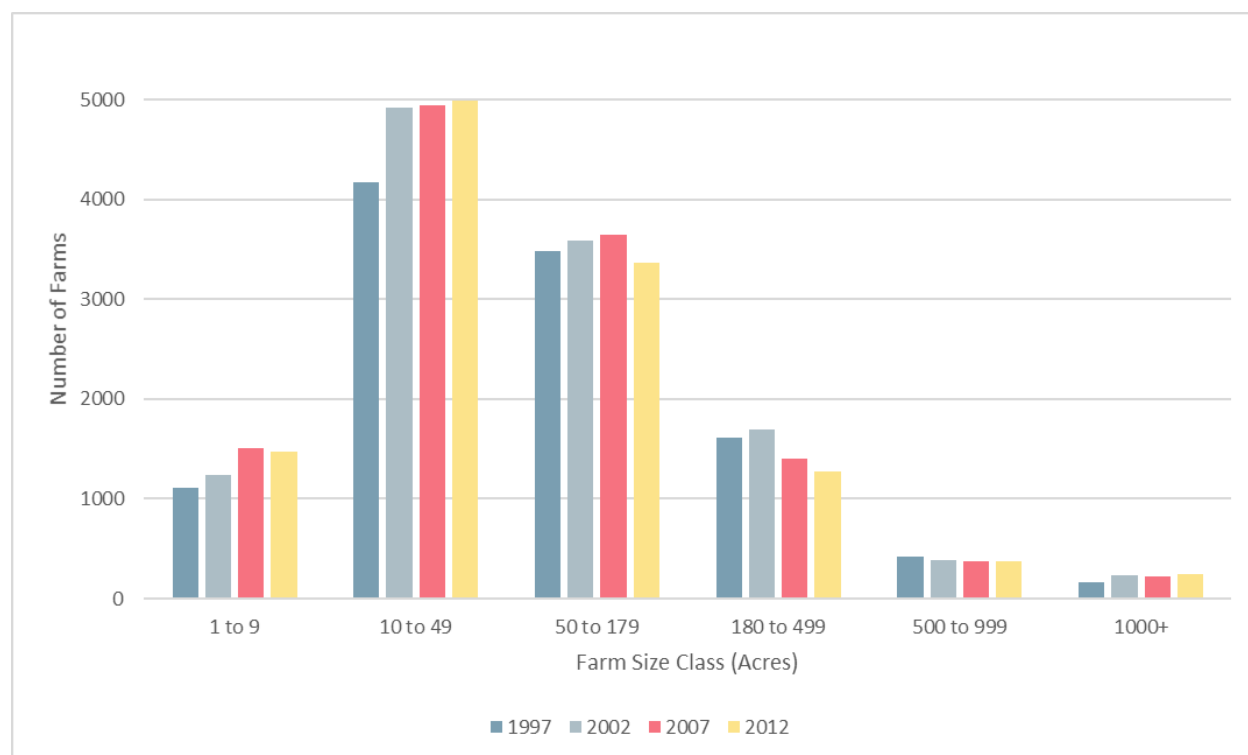
¹⁶ The National Resources Inventory defines prime rural land (or prime farmland) as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses.

Farm Sizes are Changing with Economic and Other Implications

Nationally, farms have been consolidating towards larger acreage. At the same time, there has been an increase in small farms. Both trends have contributed to the hollowing out of mid-sized farms. A 2013 report from the USDA Economic Research Service (ERS) notes that because of these changes, average farm size has changed little in the last three decades, however, significant amounts of cropland and cropland production has shifted to larger acreage farms.¹⁷

The Washington Ag Region is increasingly dominated by small acreage farms. Like national trends, the data shows losses in mid-sized farms, particularly in the range of 180 to 499 acres. It also shows very modest growth in 1,000 acre and larger farms. The increment of change is so small, however, that it is not clear if it is statistically significant. The data indicates that the increase in larger farms is outside of the more metropolitan COG region, where land prices and availability still pose constraints to increasing farm size.

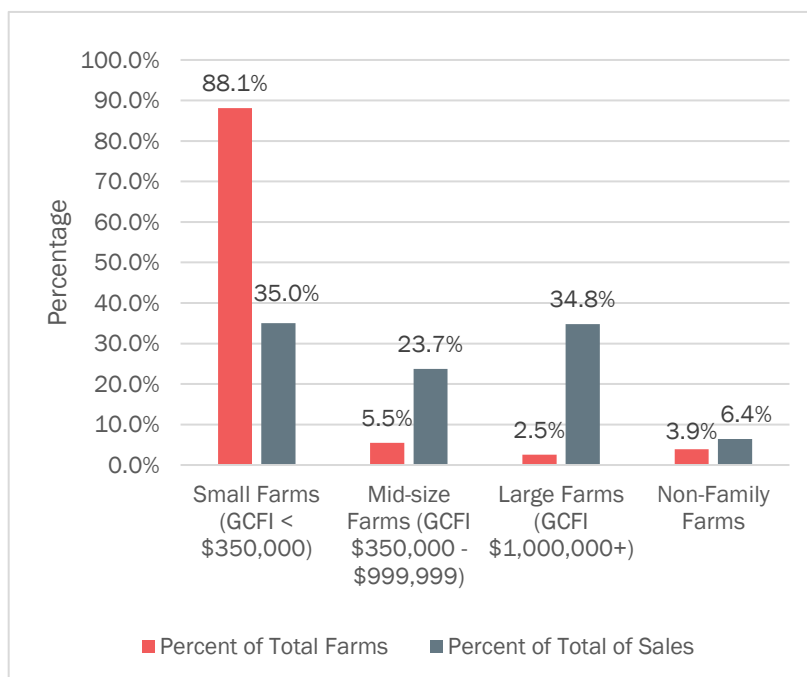
Figure 6. Changes in farms by acreage in the Washington Ag Region



Source: USDA NASS Census of Agriculture

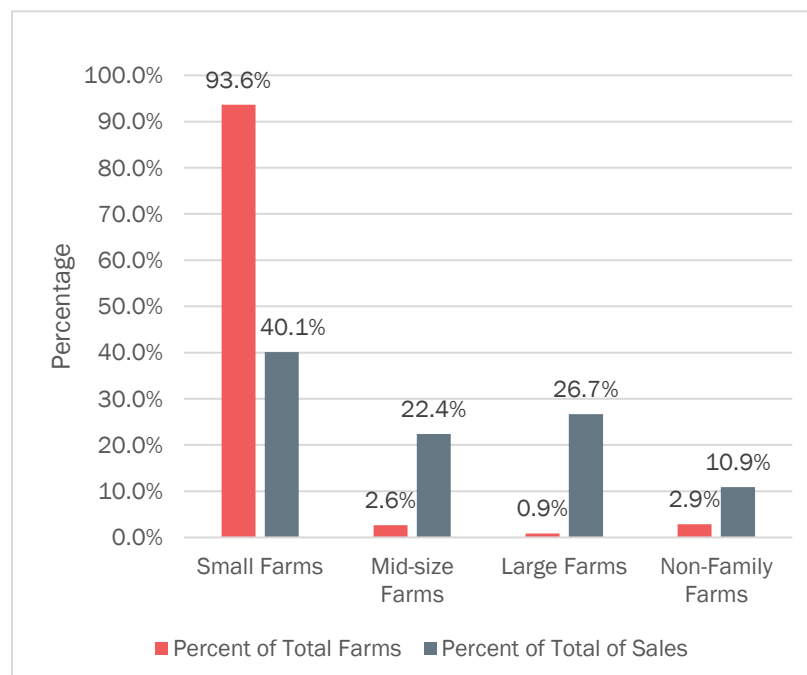
¹⁷ MacDonald, Korb, and Hoppe, "Farm Size and the Organization of U.S. Crop Farming."

Figure 7. 2012 Maryland Farm and Sale Percentage by Farm Size



Source: USDA NASS Census of Agriculture

Figure 8. 2012 Virginia Farm and Sale Percentage by Farm Size



Source: USDA NASS Census of Agriculture

UNDERSTANDING FARM SIZE AND FARM TYPOLOGY

USDA looks at farm size in several ways. **Farm size class**, shown previously, groups farms by acreage, whereas **farm size** depends on **gross cash farm income (GCFI)**.

Small farms, with less than \$350,000 in annual GCFI, make up the overwhelming number of farms in Maryland and Virginia. These farms also have a smaller share of total sales compared to other farm sizes, and may not have a household member who farms full time.¹⁸ Commercial farms generate more than \$350,000 in GCFI and may either be a family or non-family farm.¹⁹

Given the trend towards small farms in the Washington Ag Region, policymakers should be aware that regulations and other challenges often disproportionately affect them. These farms typically have fewer resources to dedicate to regulatory compliance.

FARM SIZE AND FRUIT AND VEGETABLE PRODUCTION IN MARYLAND AND VIRGINIA

Trends in fruit and vegetable acreage and sales in Maryland and Virginia illustrate the increase in small and large farms, and a decline in mid-sized farms. Given growing interest in local food and healthy food, this

¹⁸ MacDonald, Korb, and Hoppe.

¹⁹ In general, non-family farms are: cooperatives; corporations with shareholders not related by blood, marriage, or adoption; or operated by a hired manager.

update looked in-depth at how fruit and vegetable production has changed since 1997. Several detailed tables are available in [Appendix D](#).

After adjusting for inflation, fruit and vegetable farms that are 1,000 acres or more increased their share of total sales by 13 percent and 20 percent respectively. Fruit and vegetable farms less than 100 acres also increased their share of total sales by 63 percent and 31 percent respectively. Meanwhile, fruit and vegetable farms between 100 and 999 acres had their share of total sales decline by 13 percent and 24 percent respectively.

MID-SIZED FARMS MAY REQUIRE SPECIAL ATTENTION

Why is the fate of mid-sized farms a concern? Controlling for factors like soil, water availability, market proximity, etc., there are relationships between farm size and efficiencies. Historically, mid-sized and larger farms produce greater volumes, sales, and better financial returns. This influences whether farms sell to intermediaries or directly to consumers, and whether products are destined for global, national, or local markets.

Although there are exceptions, small farms are not engaged in medium and large-scale production where economies of scale are achieved, and more competitive pricing can be offered. At a time of growing interest in getting more local food into institutions such as schools, colleges and universities, hospitals, and elsewhere, supporting “agricultural in the middle” is important to ensuring farm size diversity and the capacity of the region’s farms to produce for higher volume wholesale markets.

Local institutions are interested in sourcing locally and regionally. For example, parents, students, and staff at Fairfax County Public Schools (FCPS) have been working together for the last seven years to build a robust farm-to-school program. Similarly, Arlington and Loudoun counties, as well as the District of Columbia have followed suit. However, finding consistent, local or regional product at volume during the school year is a challenge.

Fairfax County Food and Nutrition Services Director, Rodney Taylor, provides a perspective on the level of potential institutional demand that could exist for local and regional food when he points out that FCPS is “the largest food service organization in the state.” Taylor “could tell every farmer in Virginia we’ll buy what they grow, and they wouldn’t have enough to meet our needs.”²⁰ In the 2016 to 2017 school year, FCPS served an average of 23,000 breakfasts and 80,000 lunches a day over 162 days; purchasing 3.2 million pounds of produce from their distributor.

“We could tell every farmer in Virginia we’ll buy what they grow, and they wouldn’t have enough to meet our needs.”

Rodney Taylor, Fairfax County Public Schools Food and Nutrition Services Director

Relatively low production in the region and a range of challenges currently make meeting this demand problematic for most farmers. Examining the unique challenges of mid-size farms, and identifying more farmers interested in developing wholesale markets, should be a priority for building resiliency and increasing regional self-reliance.

²⁰ Rankin, “Rodney Taylor: A New Vision for School Food | Fairfax County Public Schools.”

Changing Farm Profitability and Viability

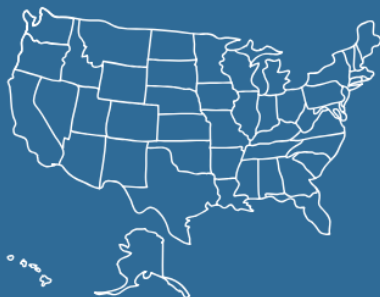
Since 1975, a farm has been considered as "any establishment from which \$1,000 or more of agricultural products were sold or would normally be sold during the year."²¹

With these data points and others from the Census of Ag, it's important to remember that when farms are grouped together, there is potentially significant variability between them, such as farms that report more than \$1,000 in sales and others that report less than \$150,000. There may also be large numbers of small farms reporting less than \$1,000 with zero sales.

Additionally, sales do not equate to profitability. Nationwide, in 2012, average agriculture sales per farm were up, as was farm-related income. However, there were also steep increases in production costs. Average net cash income per farm was \$43,750.

In Maryland and Virginia, net cash income per farm was \$38,920 and \$11,300 respectively. Calculated average net cash income per farm was -\$1,331 in the COG Region, and \$2,676 for the Washington Ag Region in 2012. Farm profitability is a real concern, and this is a key indicator to track.

Farm profitability is a real concern in the Washington Ag Region.



\$43,750
Nationwide
average net
cash income
per farm



\$2,676
Washington
Ag region
average net
cash income
per farm

Source: USDA NASS Census of Agriculture

²¹ USDA NASS, "History of Agricultural Statistics."

OUR FARMERS

Many of the key challenges facing the farming community outlined in *What Our Region Grows* in 2012 remain. Behind the numbers of declining farms, farmers, and farmland, are issues like difficult conditions for farm transition, challenges to growth, and obstacles to market access. Cost of land and land access are also barriers to expanding or starting farm enterprises.

At the same time, interest in new and beginner farmer training programs seems to be at a high. Although these numbers are small, the Regional Ag Work Group can point to a handful of young farmers not just entering into long-term leasing agreements but purchasing farms.

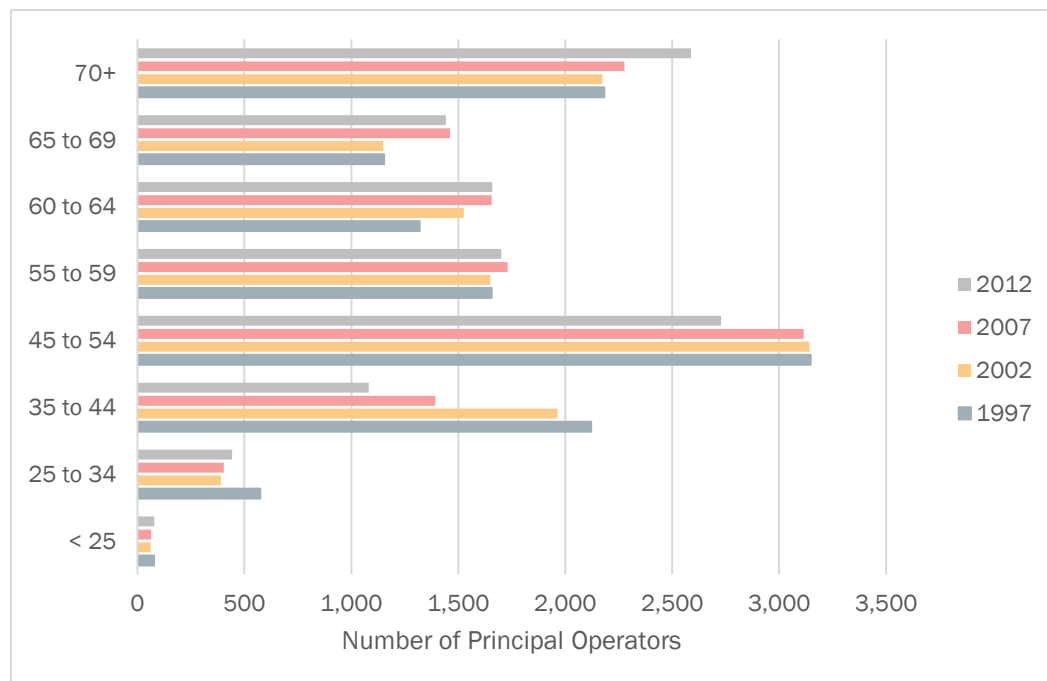
Key Trends:

1. Fewer Farmers
2. Aging Farm Population
3. Few Beginning Farmers
4. Farming Is Not the Primary Job
5. Increased Off-Farm Work

Farmers are Aging and Significant Amounts of Farmland Will Be Changing Hands

The Census of Ag collects some demographic information on up to three “operators” of surveyed farms: principal, second, and third operators. Nationwide, the average age of the principal operator or farmer rose to 58.3 years in 2012. Second and third operators are younger at 53.4 and 46 years respectively. However, their average ages also increased between 2007 and 2012.²²

Figure 9. Age of Farmers in the Washington Ag Region



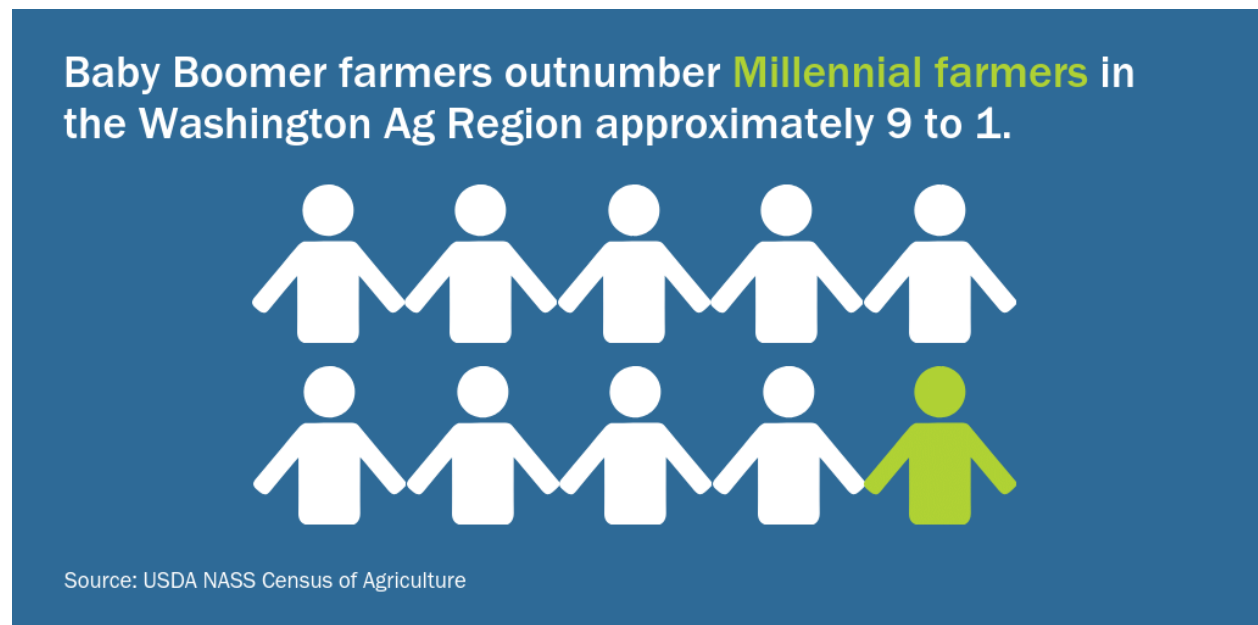
Source: USDA NASS Census of Agriculture

²² USDA NASS, “2012 Census Highlights - Farm Demographics.”

Farmers in the Washington Ag Region are older than the national average, with an average age of 59.2 in 2012. In fact, 48 percent of the region's farmers are over 60 years old. Looking at this information alone, there are not enough younger farmers to replace those entering retirement. The number of farmers over 60 years old increased by 22 percent between 1997 and 2012, while those ages between 25 and 59 declined by 21 percent.

Growing Interest in Farming?

There may be a slow resurgence of younger farmers. From 2007 to 2012, there was a slight growth (16 percent) in farmers under the age of 35. One thing to watch for in the 2017 Census of Ag is whether the data shows continued growth in younger cohorts.



In 2012, there were approximately 522 Millennial Generation farmers (principal operators) age 34 or younger in the Washington Ag Region. Compare this to the estimated 4,802 farmers who were Baby Boomers (ages 55 to 69).

Although farm operator age is alarming, The Farm Credit Council has pointed to ways in which a deeper evaluation of Census of Ag data can reveal a more nuanced picture of the age of farmers, and farm families, particularly when the probable identity of many secondary operators is considered, and small farms making less than \$1,000 a year are isolated in the analysis.²³ One of The Farm Credit Council's analyses indicates that nationally:

“the oldest segment of the farm population in terms of farm sales are farms with sales less than \$1,000 a year. This is also the category of farms that make up the largest number of farms in terms of farm count, with 28.5 percent of all farms having less than \$1,000 in sales

²³ In the Farm Credit Council's white paper “Different Ways to Look at the Aging of U.S. Farmers,” points out that the average farm age – collected only since 2007 – is lower than the average principal operator age as many secondary and tertiary operators have a lower average age than the principal operator. They believe that one reason the average farm age isn't even than lower is because of “the large number of spouses that are active in farm operations.” The Census of Agriculture does not collect information on the relationship of operators to one another, but The Farm Credit Council points out that many of the primary and secondary operators are around the same age/generation thus having a “dampening effect” on the difference between principal operator average age and average farm age which includes principal, secondary, and tertiary (junior) operators.

as of the 2012. Although this category accounts for the largest segment of the farm operator population, in terms of total value of farm sales they account for .02 percent of total farm sales in 2012.”

The extent to which this is true in the region is unknown, but it merits additional exploration and perhaps a request to USDA NASS for a special statistical tabulation to provide a more detailed picture of the age of the region’s farm workforce.

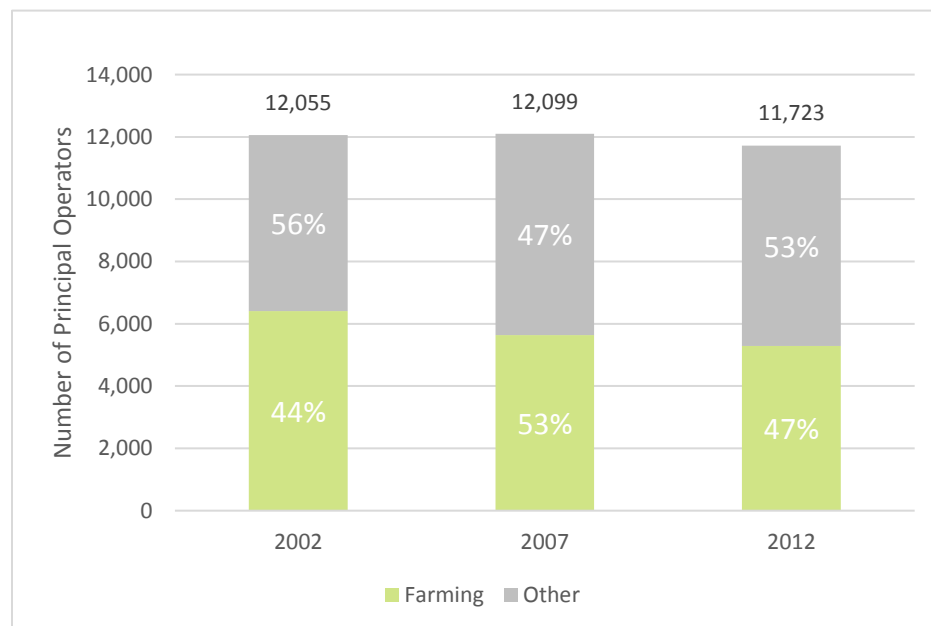
Nevertheless, cultivating and making a place for the next generation of farmers remains a challenge for reasons that extend beyond an aging workforce. Furthermore, there is a coming transfer of assets from Baby Boomers to subsequent generations which will have important implications for farming and the region’s food system. Using 2012 and 2014 data on the age and farmland acreage owned by seniors 65 and older, American Farmland Trust calculated that more than 370 million acres of farmland is likely to change hands in the next 20 years across the country.²⁴

Fewer Farmers Are Farming Full-Time

Another manifestation of the challenges of farming shows up in the fact that most of the region’s farmers hold another job besides farming. Sixty-three percent of principal operators work off-farm and 55 percent consider their off-farm job as the primary job. This is not surprising for several reasons, including the high cost of living in the region.

The Census of Ag does not ask farmers how many would prefer to farm full-time. Anecdotal evidence from the Regional Ag Work Group and COG staff suggests that many would farm full-time if it were more profitable, and issues like the rising cost of healthcare could be mitigated.

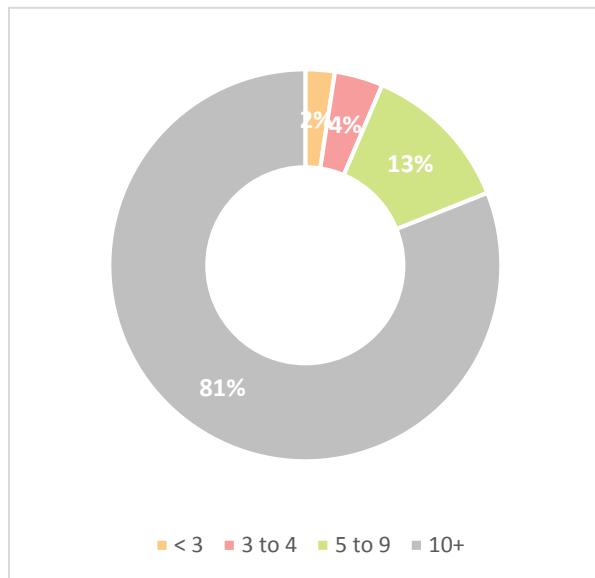
Figure 10. Primary Occupation of Farmers in Washington Ag Region



Source: USDA NASS Census of Agriculture

²⁴ Farmland Information Center, “2014 Tenure, Ownership, and Transition of Agricultural Land Survey Infographics.”

Figure 11. Years of Farm Experience in Washington Ag Region, 2012



Source: USDA NASS Census of Agriculture

Figure 12. Male and Female Operators in Washington Ag Region



Source: USDA NASS Census of Agriculture

What about farm experience in the Washington Ag Region? As of 2012, 19 percent of farmers in the region were considered beginning farmers as defined by the USDA, those who operated a farm for fewer than 10 years. Of these farmers, one-fifth have farmed for fewer than five years. While it is critical to have experienced farmers, the demographic trends captured by the Census of Ag do not suggest a steady pipeline for farm transition.

The Face of Farming in the Washington Ag Region

Diversity in the farm community is important for the future of agriculture in the region. Having farms that vary in scale, markets, and products, helps build resilience for the business and the food system. Diversity among farmers is also crucial. The knowledge and skills that comes from those of different backgrounds and cultures can help develop a well-rounded knowledge base to support future farmers. It can also spur innovation and new market opportunities that arise through different networks and collaboration. To this end, the report looks at some trends related to women farmers, minority farmers, as well as low-sales and zero-sales farms.

WOMEN FARMERS

Looking at numbers for all farm operators—not just principal operators—about one in four farmers in the Washington Ag Region are women. Interestingly, the COG Region has a higher proportion of female farmers at about one in three.

The unique interests and demands for women farmers and landowners in the region have been recognized for some time with the formation of classes and organizations specifically targeted to support them, such as trainings like Annie's Project, American Farmland Trusts' recent learning circles for female farmland owners, and the launch of Virginia Agri-Women.

MINORITY FARMERS IN THE REGION

Nationwide, the number of minority-operated farms grew between 2007 and 2012.²⁵ Although growth varies across minority groups. Similarly, minority-operated farms increased in the Washington Ag Region during this period. In particular, there was significant growth among Hispanic and Asian operated farms. Hispanic-operated farms increased by 70 percent and Asian-operated farms increased by 98 percent; nationally, the percentage growth was 21 percent and 22 percent respectively.

While these percentage increases are large, the number of minority operators is still very low relative to all farmers. In fact, there were only a dozen more minority-operated farms during this period and the growth among Hispanic and Asian operated farms was offset by a 15 percent decline in Black-operated farms.

Table 5. Operators by Race and Ethnicity in the Washington Ag Region

All Operators by Race	2002	2007	2012
American Indian or Alaska Native	0.4%	0.5%	0.4%
Asian	0.3%	0.5%	0.6%
Black or African American	1.8%	1.7%	1.6%
Native Hawaiian or Pacific Islander	0.0%	0.1%	0.1%
White	96.9%	96.6%	96.9%
More than one race	0.5%	0.7%	0.5%
All Operators of Spanish, Hispanic, or Latino Origin	1.1%	1.2%	1.8%

Source: USDA NASS Census of Agriculture²⁶

Policymakers should be aware of additional challenges faced by minority farmers as well. Historically, African American farmers were discriminated against and not given the same level of access to federal farm programs that could support their business development.²⁷ Several reports also show that African American farmers have lost land at higher rates than white farmers have. A class action lawsuit to begin to address some of these past harms against African American farmers was successfully brought against the USDA in the late 1990's, however, more work remains.

²⁵ USDA NASS, "2012 Census Highlights - Farm Demographics."

²⁶ Demographic data from years prior to 2002 are not directly comparable to those afterwards due to new methods used for data collection beginning in 2002. Further, not all farm operator characteristics were surveyed in every Census of Ag. For instance, the gender of the operator was not surveyed until 1978. Race categories were not surveyed consistently prior to 2002. Most early Ag Censuses surveyed for white or non-white; most races and ethnicities were left out until 1978.

²⁷ King, "Needs Assessment of Black Farmers on the Delmarva Peninsula."

LOW SALES AND ZERO SALES FARMS

In 2012, more than half of all farms in the country had sales of less than \$10,000. Minority farmers are more likely to have low sales. Nationally, minority-operated farms, except for Asian operated-farms, tend to have a disproportionate number of farms in this group.²⁸ In particular, Black farmers are most likely to be in this category. A report by The Common Market also shows that most Black farmers in the Delmarva have sales under \$25,000 a year.²⁹

A recent journal article from a University of Arkansas Law visiting professor entitled “Farmers who don’t farm: The curious rise of the zero-sales farmer,” argues that there needs to be more analysis of farmers who do not sell any products. Using previously unreleased Census of Ag data, his research found:

“there was a large increase in the number of zero-sales farmers...as well as a remarkable rise in their share of the farming population, from 5 percent in 1982 to 22 percent in 2012. Women and minority farmers were disproportionately likely to be zero-sales operators: at least 30 percent of women, Native American, and black farmers reported no sales in 2012. Older and beginning farmers were also more likely to report zero sales...”³⁰

Currently, data on zero-sales farms is unavailable for the region. However, this information will be critical for informing policies that promote diversity, provide opportunities, and strengthen the agricultural economy. It also has significant implications for developing strategies to help beginning farmers start and sustain profitable businesses.

²⁸ USDA NASS, “2012 Census Highlights - Farm Demographics.”

²⁹ King, “Needs Assessment of Black Farmers on the Delmarva Peninsula.”

³⁰ Rosenberg, “Farmers Who Don’t Farm.”

AGRICULTURE IN THE REGION TODAY

Supporting agriculture and farm viability requires understanding the unique attributes of agriculture in rapidly urbanizing regions such as metropolitan Washington. New and better data, and more on-going communication is needed for policymakers, the public, investors, technical assistance providers, researchers, and current and future farmers to strategically position the sector in a rapidly changing marketplace and a warming climate. It is also needed to capitalize on emerging opportunities to educate an increasingly urban population on the benefits and contributions of agriculture.

Not only is agriculture a significant economic driver but it is the basis for a functioning society. The current health of our food system determines the food supply of current and future generations. A lack of farms, farmland, and farmers can present food security risks and missed opportunities to build a diverse, resilient region. Agriculture also affects the health of the environment, and there are a range of farming practices that can enhance or negatively affect it.



In August 2018, the experienced farmers of The Farm at Sunnyside in Rappahannock County, VA posted the images above on social media to illustrate some of the impacts of excessive rain on the farm. The farmers were one of several farm businesses in the region sharing the impact of a changing climate and unpredictable weather on their operation. (The Farm at Sunnyside)

Environmental Improvements

One agricultural bright spot relates to the progress in the implementation of on-farm best management practices (BMPs) in the Washington Ag Region, which, along with municipal wastewater treatment plant upgrades, have reduced nutrient run-off from farms and urban communities to positive effect on the Chesapeake Bay. Farming is a complex business requiring farmers to be managers and stewards of their land and other natural resources while also remaining financially viable. Across a broad spectrum of farming practices, there's the potential to enhance or negatively affect soil and water.

The Chesapeake Bay Foundation's midpoint assessment of progress in the Bay's clean-up found that the multi-state, Chesapeake Bay Watershed Agreement is working. There are continued indicators of improved water quality, including a recovering oyster population and growing underwater grass beds. The latter are key to providing food and habitat to wildlife, trapping sediment and nutrient pollution, and more. Maryland and Virginia are making good progress and should continue to fund effective

cost-share programs for agriculture, such as BMPs. Polluted run-off from urban and suburban areas remains a challenge for both states. Pennsylvania lags significantly in reducing pollution to the Chesapeake Bay, including from agricultural sources.³¹ It must also be acknowledged, however, that record rainfall in 2018 also resulted in adverse impacts to Bay health.

Other positive developments include the expanding regional interest in building soil health and the potential this holds both for carbon sequestration and increased on-farm resiliency. COG members have spent more than a decade working together to find solutions for reducing greenhouse gas emissions (GHGs) from the buildings and transportation – the largest sources of regional and national GHGs. The science related to carbon sequestration in soils is still evolving; however, it is quite possible that this is an additional way that healthy, rural landscapes and soils will be identified as critical to the overall health of metropolitan regions.

Local Food and Agriculture is Good for Business

Some farms are finding success in direct-to-consumer markets such as farmers markets, farm stands, and Community Supported Agriculture (CSA) subscriptions.

Packaged Facts, a food industry research firm, reported that 53 percent of American adults seek out locally grown or locally produced foods with almost half of the survey respondents stating they were willing to pay 10 percent more for these foods. Nationally, local food sales grew from \$5 billion to \$12 billion between 2008 and 2014. This number is expected to reach \$20 billion by 2019.³² Many consumers perceive local food as fresher, healthier, and better tasting. In addition, consumers want to know their farmer and support local businesses.

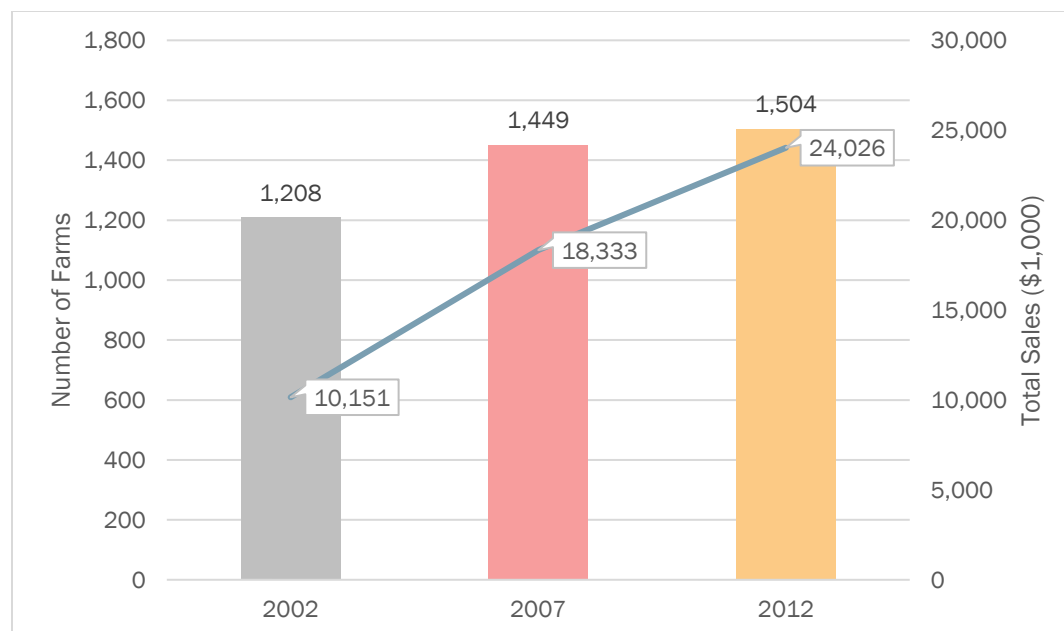
In the Washington Ag Region, there continues to be demand for local food. The region's high median household income has helped fuel demand, as people are able to spend more on products they perceive as superior. Thus, **direct-to-consumer sales** and **direct farm sales** have grown. Between 2002 and 2012, there was a 25 percent increase in the number of farms involved in direct-to-consumer sales and a 137 percent increase in direct-to-consumer sales. Similarly, in 2015 Maryland and Virginia contributed \$84 million and \$217 million respectively in direct farm sales.³³

³¹ Cox, "What You Need to Know about Chesapeake Bay's Cleanup at Its Midpoint."

³² Packaged Facts, "Packaged Facts: Sales of Local Foods Reaches \$12 Billion"; Hesterman and Horan, "The Demand for 'local' Food Is Growing — Here's Why Investors Should Pay Attention."

³³ USDA NASS, "Local Food Marketing Practices."

Figure 13. Direct-to-Consumer Sales in the Washington Ag Region



Source: USDA NASS Census of Agriculture

Farmers Markets

Today, there are more than 200 farmers markets in and around the nation's capital.³⁴ As these have grown, so have new organizations to serve a mosaic of public, non-profit, and for-profit farmers markets. Since the 2012 report, two new statewide organizations launched, joining the informal DC Farmers Market Collaborative: Maryland Farmers Market Association, and Virginia Farmers Market Association.

Although farmers markets may not move large volumes of food relative to wholesale channels, there is some innovation occurring, including limited wholesale distribution. Further, farmers markets may make broader economic and social contributions than are currently measured and communicated. More importantly, they will remain critical ambassadors for agriculture throughout the region's diverse communities.



Old Town Farmers Market at Market Square in the City of Alexandria. (City of Alexandria Department of Recreation, Parks, and Cultural Activities)

³⁴ Elder, Krystal, and Chow, "Farmers Markets in the Washington, D.C. Area."

Economic Impact of Local Agriculture

Local agriculture is not just a feel-good marketing strategy. It benefits both the farmers and the local economy. Buying local food allows farmers to keep more of the retail food dollar and creates benefits through the multiplier effect. The baseline multiplier for buying local is 1.4 to 2.6 depending on the locale and commodity.^{35,36} The larger the multiplier, the more a dollar circulates in a region and can create more income, wealth, and jobs.

FRESHFARM DOWNTOWN SILVER SPRING MARKET



FRESHFARM's downtown Silver Spring Farmers Market. (FRESHFARM)

Consider the 2016 economic impact study of FRESHFARM's year-round, Silver Spring farmers market. The multiplier effect for this Saturday market was determined to be 1.96.³⁷ The market generated about \$6.6 million in economic impact; \$3.2 million of which represents increased revenue collected by nearby businesses. It also generated close to \$100,000 in sales tax revenue.

³⁵ Meter, "Local Food as Economic Development."

³⁶ Research at Iowa State University shows that the multiplier for a farm may be 1.4 in an area where large-scale farms prevail; smaller farms in small-farm areas of Wisconsin report a higher multiplier of about 2.6.

³⁷ marketumbrella, "SEED | FRESHFARM Downtown Silver Spring."

Local Agriculture is Fueling Business Model Expansion

There has also been growth in Community Supported Agriculture (CSA), multi-farm CSAs, and alternative services offering local food. In 2012, there were few businesses aggregating local food every week and delivering it right to the consumer's door in the region. Today, businesses like the long-established Washington Green Grocer are joined by 4P Foods, From the Farmer, and Hungry Harvest. All these businesses source some amount of their offerings locally and provide the convenience of home or office delivery. Fresh Direct, an online grocery service, recently entered the D.C. market too. It offers regional products alongside other household staples.

Multi-farm CSAs and cooperatives have also grown or become more sophisticated to deliver a greater variety of product to customers, year-round, and in more drop off locations. For example, Lancaster Farm Fresh Co-op sources from more than 100 family farms and delivers year-round to over 100 pick-up locations from Northern Virginia to New York City. Similarly, Frederick County's South Mountain Creamery delivers farm-fresh milk, eggs, meat, produce, and other products each week to customers' homes.



(South Mountain Creamery)

Growth in Craft Beverage, Including On-Farm Businesses

As another example of how quickly thinking about food and agriculture are changing in the COG region, there has been exponential growth in the “high-end” agricultural sectors (e.g. wine, specialty meats, and artisan dairy products). The local craft beverage industry in the District of Columbia, Maryland, and Virginia has grown rapidly in recent years. In 2012, on-farm breweries, distilleries, cideries, and meaderies were not even permitted by zoning in several COG jurisdictions like Prince George's, Montgomery, and Charles counties. Today there is a much broader ability to start an on-farm craft beverage business in the COG region.

Currently, there are an estimated 250 craft breweries, distilleries, and wineries in the Washington Ag Region and this number is growing.³⁸ The increase in breweries and distilleries presents additional and new market opportunity for farmers interested in growing grains and hops for these supply chains.

Nationally, there are signs of market saturation in craft beer. However, it is not clear that this is a concern in the Washington Ag Region.³⁹ Furthermore, the Brewers Association notes that the

³⁸ The craft beverage industry is evolving rapidly, and it is difficult to get an updated count. There are many businesses in-planning.

³⁹ Kelso, “Craft Beer Industry Showing Signs of Saturation.”

industry is still growing at five percent annually. However, increased competition at the individual firm level means businesses may not grow at the rate they expected to a few years ago.⁴⁰

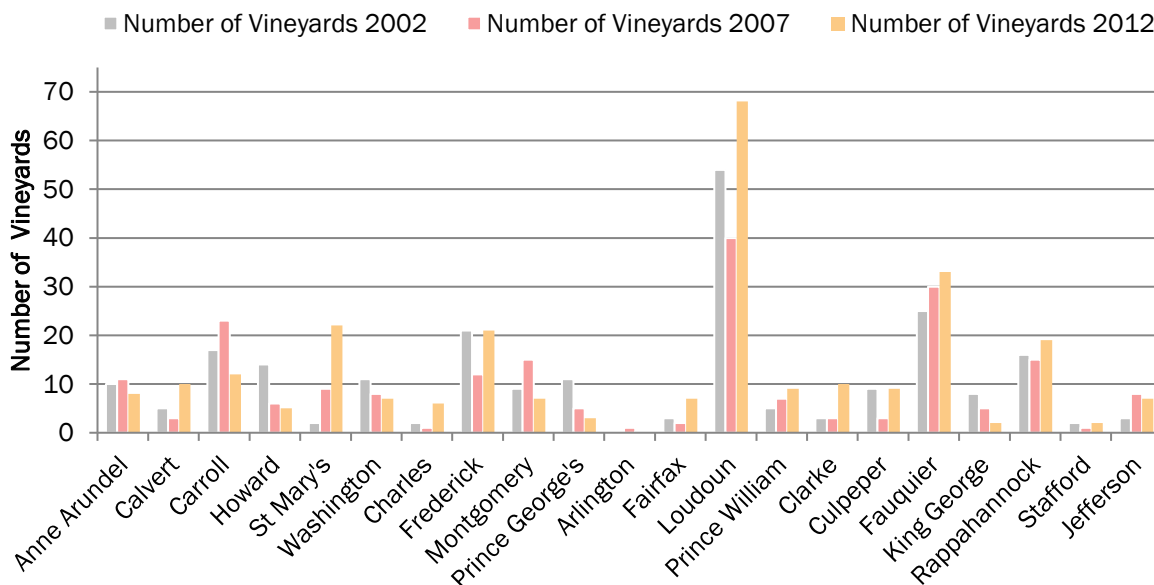
Vineyards also continue to increase in the region, especially in Virginia with most of the new vineyards opening in Loudoun and Fauquier counties. Similarly, new vineyards have also opened in Maryland, with St. Mary's County experiencing significant growth.⁴¹

Whatever level of maturation the craft beverage industry may or may not be reaching in the region, the number of businesses varies significantly within the region's individual jurisdictions.



Harvest time at Twin Notch Farm in Waterford, VA (Richard Sullivan/Walsh Family Wine)

Figure 14. Vineyards in the Washington Agricultural Region



Source: USDA NASS Census of Agriculture

⁴⁰ Watson, "Analyzing 2017 Craft Brewery Growth."

⁴¹ It is important to remember that the number of vineyards is not the number of wineries. The former is the number of operations that grow grapes (with bearing and non-bearing acreage). Some, but not all, vineyards are also wineries where wine is made and sold.

Agritourism Bringing More Visitors and Sales to the Farm

Agritourism operations and sales are growing. Agritourism comes in many forms ranging from, on-farm breweries, to family friendly pick-your-own fruit and vegetable, flower, and herb operations, and even goat yoga. Adding opportunities for on-farm activities and experiences can be a very important and effective way for farmers to creatively diversify their revenue sources.

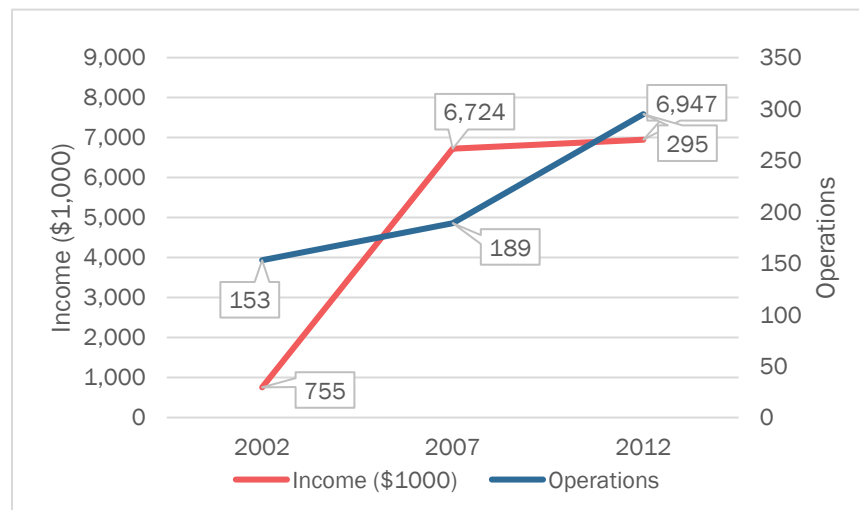


Pick-your-own lavender at Blooming Hill Lavender Farm, Loudoun County, VA. (Blooming Hill Lavender Farm)

Agritourism has increased significantly in this region, almost doubling from 153 to 295 operations in 2002 to 2012 respectively. Likewise, income from agritourism has skyrocketed from about \$0.75 million to \$7 million during the same period.

Figure 15 shows that more recent growth in agritourism income in the Washington Ag Region appears to have been driven by farm businesses in the more metropolitan (and populous) COG jurisdictions. This is a data point that all local governments may wish to examine for their communities as agritourism will be key to the future viability of many farm businesses in the region. Agritourism represents a place-based, comparative advantage that local farms do not compete on with other farms across the country or the globe.

Figure 15. Agritourism Operations & Income in Washington Ag Region



Source: USDA NASS Census of Agriculture

Evidence of profitability will incentivize more farms to engage in agritourism. Up to date policies are key to keeping agricultural opportunities like this one open in the future, while maintaining land in farms. Recognizing the importance and interest in agritourism from local farmers, and potential impacts on nearby communities, Montgomery County is currently finalizing an agritourism study to better understand and support it in the future.



Agritourism examples **clockwise from top left**: A picture perfect view from Stillpoint Farm at Milkhouse Brewery in Frederick County, MD which specializes in beer made with Maryland grown hops and Maryland grown and malted barley, wheat, and rye. (COG) **Top right**: Outside The Farm Brewery at Broad Run in Prince William County, VA (Prince William County Government). **Middle and lower right**: Inside the farm store at Butler's Orchard in Montgomery County, MD, also offering pick-your-own fruits and vegetables. (COG) **Lower left**: Pick-your-own pumpkins at Yankey Farms in Prince William County, VA. (Yankey Farms) **Middle left**: Visitors to Larriland Farm in Howard County, MD on a tractor ride as part of the farm's pick-your-own fruits and vegetables business. (Howard Soil Conservation District)

Before turning to production and regional consumption estimates for the Washington Ag Region, here's a brief look at some of the dynamic ways that agriculture, and how we think about it, is changing in the District of Columbia, every county in the COG Region, and neighboring Howard and Fauquier counties.


LOCAL AGRICULTURE: QUICK FACTS

Agriculture in the COG region is changing rapidly, so quickly that there are new policies, programs, and businesses for which there is no standard data collection at the federal, state, and sometimes county and municipal levels. One benefit of convening local specialists, like members of COG's Ag Work Group, is that they can help gather and validate agricultural data collected from various scales. The data that appears in this first edition of *Local Agriculture: Quick Facts* relies on the best available data from federal, state, county, and local sources.

This information should be considered the most accurate estimate as of January 2018 unless otherwise noted. COG welcomes input from stakeholders from across the region to update this information.

Further, please note that while Virginia, Maryland, and the District of Columbia all have economic impact studies of their agricultural and or food industries, the scope of the supply chains included in the studies vary significantly.

LEGEND: DATA SOURCES

 Agricultural Sales: 2012 Census of Ag

Economic Impact: VA, MD, and DC Economic Impact Studies (2015)



Farms and Farmers: 2012 Census of Ag

Farmland: 2012 Census of Ag



Ag Assessed Acres: State and County Sources (2017)

Preserved Farm Acres: County Sources (2017)

Farmland Value/Acre: Local Sources (2017)



Farmers Markets: Local Knowledge









Urban Farms, Community Gardens, and School Gardens: Local Knowledge



Wineries, Breweries, and other Craft Beverage: Local Knowledge

ARLINGTON COUNTY, VA

	\$66.1 M Economic Impact		Urban Farms: 3 Farmers: 5		Farmland Value/Acre: \$53,764
	11 Farmers Markets		Community Gardens: 57 School Gardens: 36		2 Breweries

MAJOR PRODUCTION CHANGES SINCE 2007

- 15 percent growth in school gardens.
- 25 percent growth in community garden plots.
- 200 percent growth in urban farms.







FOOD AND AGRICULTURE ACCOMPLISHMENTS SINCE 2012

- The County has experienced 57 percent growth in farmers markets since 2007 and has the highest number of farmers markets per capita in the USA at about one per 20,000 residents.
- County Board appointed an Urban Agriculture Task Force of 20 community stakeholders who submitted recommendations for a food action plan in 2013.
- The County created and filled the first regional Urban Agriculture Coordinator position in 2013 to encourage urban agriculture and access to healthy foods through education, demonstration and collaboration. A new community organization, Arlington Friends of Urban Agriculture, was launched in 2015 in response to public interest.
- County Board designated each October as Urban Agriculture Month in 2014.
- Arlington County Public Schools hired one of the first full-time Farm-to-School Coordinators in Northern VA in 2014, following several years of ACPS Food and Nutrition Service accomplishments in building relationships with local and regional farms.
- Hosted and sponsored the 3rd annual Virginia Urban Agriculture Summit in 2017.

OBSERVATIONS AND TRENDS TO WATCH

- Ongoing interest in community gardening with demand expressed by a waitlist of approximately 500 names.
- Increasingly, new high-density developments are incorporating gardens and other urban agriculture installations as an amenity.
- Growing number of privately owned urban gardens and small farms, and private and commercial installations of rooftop agriculture and indoor hydroponics.
- Continued interest in supporting regional agriculture through farmers markets and provision of local products to large grocers, schools, universities, hospitals, and other institutions.

CHARLES COUNTY, MD

 <p>\$11.9 M Ag Sales</p> <p>\$46.5 M Economic Impact</p>	 <p>Farms: 382 Farmers: 614 Farmland: 46,659 acres</p>	 <p>Ag Assessed Acres: 126,934 Preserved Farm Acres: 23,048 Farmland Value/Acre: \$6,453</p>
 <p>3 Farmers Markets</p> <p>4 CSAs</p>	 <p>Community and School Gardens: no data at this time</p>	 <p>1 Distillery</p>

MAJOR PRODUCTION CHANGES SINCE 2007

- Significant growth in grain production, especially with sorghum. In 2012, the county produced the most sorghum of any county in Maryland.
- 41 percent decline in meat chicken inventory.
- 68 percent increase in layer hen inventory.
- 39 percent decline in cattle and calf production.

FOOD AND AGRICULTURE ACCOMPLISHMENTS SINCE 2012

- Hired the county's first Agricultural Marketing Specialist in 2017 to help farmers with business development, and to grow the agricultural economy.
- Reached 65 percent of its goal to preserve 50 percent of the county's 293,000 acres of land in 2017 – a goal initiated in 2006.
- Southern Maryland Agricultural Development Commission facilitated the approval of a new sorghum syrup harvesting process in 2017 for Next Step Produce, a grain farm in the County.

OBSERVATIONS AND TRENDS TO WATCH

- Agritourism sales have more than doubled since 2007.
- Pick-your-own and small fruit operations are gaining momentum.
- A Zoning Text Amendment related to Alcohol and Farm Alcohol Production was introduced in 2018.

DISTRICT OF COLUMBIA



\$5.47 B
Economic
Impact



Urban Farms: 18
Farmers: 22
Farmland: 14
acres



No data



62
Farmers
Markets

7 CSAs



Community
Gardens: 73
School Gardens:
134



12 Breweries
1 Winery
9 Distilleries
1 Cidery

MAJOR PRODUCTION CHANGES SINCE 2007

- 37.6 percent growth in number of school gardens.
- Almost doubled the number of community gardens from 35 in 2009.
- Almost quadrupled the number of farmers markets from 16 in 2006.







FOOD AND AGRICULTURE ACCOMPLISHMENTS SINCE 2012

- Established an innovative Produce Plus Program to connect low-income consumers with healthy food at farmers markets; investing \$1.9 million of public dollars in the program since 2014.
- Passed the Healthy Tots Act of 2014 to provide a local financial subsidy for healthy food, including local food, for DC childcare centers.
- Passed the Urban Farming and Food Security Act of 2014.
- Established a Food Policy Council in 2015 and the first (and only), full time Food Policy Director position in local government in the COG region in 2014.
- Signed onto the Milan Urban Food Policy Pact in 2018. It is an international agreement upholding the importance of urban agriculture and sustainable, resilient regional food systems.
- Released an Equitable Food Incubator Grant for \$250,000 in spring 2018 to support processing and value-add processing in the region.

OBSERVATIONS AND TRENDS TO WATCH

- Only COG member to financially incentivize purchase of local food for school meals.
- Continued increase in urban agriculture, including rooftop agriculture.
- Growing number of food incubators and commercial kitchens for food entrepreneurs.
- Undertaking a food economy study to understand the sector's impact on DC's local economy as well as opportunities to enhance it.

FAIRFAX COUNTY, VA

 <p>\$3.4 M Ag Sales</p> <p>\$780 M Economic Impact</p>	 <p>Farms: 148 Farmers: 235 Farmland: 7,856 acres</p>	 <p>Ag Assessed Acres: 3,451 Farmland Value/Acre: \$15,156</p>
 <p>11 Farmers Markets</p> <p>3 CSAs</p>	 <p>Community Gardens: 9 School Gardens: 35</p>	 <p>10 Breweries 2 Wineries 1 Distillery</p>

MAJOR PRODUCTION CHANGES SINCE 2007

- 12 percent increase in land in farms.
- 87 percent decline in corn for grain acreage.
- 11 percent decline in hay acreage.







FOOD AND AGRICULTURE ACCOMPLISHMENTS SINCE 2012

- County Board approved \$500,000 in 2017 to match the VA Governor's Agriculture & Forestry Industries Development (AFID) Fund to support the expansion of agribusiness and agritourism.
- Fairfax County Public Schools made significant changes to Food and Nutrition Service in 2015, hiring a new Director and Farm-to-School Coordinator.
- Formed the Fairfax Food Council in 2015 and hired a part-time coordinator.
- Completed a Community Food Assessment in 2015 through the Partnership for a Healthier Fairfax.

OBSERVATIONS AND TRENDS TO WATCH

- Agriculture generated \$780 million in economic impact for the county.
- Ranks fifth in the number of agricultural jobs in Virginia.
- Growing interest in home gardening and urban agriculture.
- The County is expecting to make changes to allow for a broader set of urban agriculture activities in select locations.

FAUQUIER COUNTY, VA

 <p>\$53.9 M Ag Sales</p> <p>\$297 M Economic Impact</p>	 <p>Farms: 1,258 Farmers: 1,996 Farmland: 228,285 acres</p>	 <p>Ag Assessed Acres: 202,903 Preserved Farm Acres: 104,873 Farmland Value/Acre: \$7,395</p>
 <p>3 Farmers Markets</p> <p>7 CSAs</p>	 <p>Community Gardens: 3 School Gardens: 3</p>	 <p>4 Breweries 26 Wineries 1 Cidery 1 Meadery</p>

MAJOR PRODUCTION CHANGES SINCE 2007

- 12 percent increase total market value of products sold in 2012.
- 9 percent decrease in hay acreage.
- 63 percent increase in corn, wheat, and soybean acreage.
- Significant increase in meat chicken production; from 475 to 16,247 birds.
- 140 percent increase in laying hens; from 3,571 to 8,550 birds.
- 3 percent decrease in cattle and calves.







FOOD AND AGRICULTURE ACCOMPLISHMENTS SINCE 2012

- Made several significant purchases using the county's Purchase of Development Rights (PDR) program to preserve farmland. Several farm owners took a creative approach by reinvesting the funds from the sale of these development rights into on-farm businesses such as Moo Thru Ice Cream and Messick's Farm Market.
- Created the Fauquier Education Farm in 2010 as a nonprofit community farm operated in partnership with the VA Cooperative Extension.
- Launched the Fauquier Farm Link in 2017 to connect landowners and farmers looking for land.

OBSERVATIONS AND TRENDS TO WATCH

- The Fauquier Education Farm announced the new Small Farm Incubator Program in early 2018. It is an opportunity for up to four new farmers who are ready to launch, but do not have access to land and equipment.
- Growing number of wineries and breweries in the County.
- Continued use and interest in the county's HomeGrown Program, which helps consumers identify products grown and made in the county.
- Continued high level of equine activity. The County ranks second in the number of horses and ponies within the state.
- Efforts are underway to investigate opportunities for a centralized facility that incorporates critical activities such as value-added processing, aggregation, distribution, marketing, meat processing, etc.

FREDERICK COUNTY, MD

 <p>\$150.5 M Ag Sales</p> <p>\$1.48 B Economic Impact</p>	 <p>Farms: 1,308 Farmers: 2,140 Farmland: 181,512 acres</p>	 <p>Ag Assessed Acres: 222,128 Preserved Farm Acres: 57,152 Farmland Value/Acre: \$7,595</p>
 <p>17 Farmers Markets</p> <p>12 CSAs</p>	 <p>Community Gardens: 13</p>	 <p>15 Breweries 13 Wineries 5 Distilleries 3 Cideries 1 Meadery</p>

MAJOR PRODUCTION CHANGES SINCE 2007

- 18 percent increase total market value of products sold.
- 30 percent decline in dairy cows.
- 13 percent increase in corn, wheat, and soybean acreage.
- 24 percent decrease in hay acreage.

FOOD AND AGRICULTURE ACCOMPLISHMENTS SINCE 2012

- Passed a Limited Farm Alcoholic Beverages tasting room zoning amendment in 2017 to allow farmers to diversify businesses with lower startup costs.
- Launched Homegrown Frederick Magazine in 2014 as a free marketing resource for direct to consumer farmers. It has reached over 10,000 consumers each year.
- Established the Frederick County Food Council in 2018.

OBSERVATIONS AND TRENDS TO WATCH

- Value-added agriculture and agritourism has grown tremendously.
- Home to largest craft brewery in Maryland: Flying Dog Brewery.
- The “Farm to Bottle” movement is growing, and the County leads the way in number of vineyard acres, wineries, and farm breweries in Maryland.
- Home to 21 percent (17 of 81) of Maryland’s USDA certified organic farms; the most of any county in Maryland or the Washington Ag Region in 2012.
- On-farm creameries are growing in popularity to control dairy prices in volatile milk market.

HOWARD COUNTY, MD



\$31.9 M
Ag Sales

\$1.88 B
Economic
Impact



Farms: 300
Farmers: 496
Farmland: 37,475
acres



Ag Assessed Acres: 36,760
Preserved Farm Acres: 23,000
Farmland Value/Acre:
\$10,961



6
Farmers
Markets

7 CSAs



Community
Gardens: 6
School Gardens: 3
Urban Farms: 3



6 Breweries
2 Distilleries

MAJOR PRODUCTION CHANGES SINCE 2007

- 34 percent increase in land in farms.
- 41 percent increase total market value of products sold in 2012.
- 77 percent increase in corn, soybean, and wheat acreage.
- 38 percent decrease in cattle and calves.
- 13 percent decline in acreage for bedding plants, floriculture, and nurseries.

FOOD AND AGRICULTURE ACCOMPLISHMENTS SINCE 2012

- The Agriculture Science Academy opened its doors in fall 2018 to the first class of 11th and 12th grade honors students at the county's Applied Research Lab. There are 15 students from five high schools enrolled.
- The Agriculture Science Academy students formed a Future Farmers of America (FFA) chapter, the first chapter the county has had in 25 or 30 years.
- BTS Bioenergy broke ground at Maryland Food Center Authority (MFCA) in May 2018 for a biodigester that creates energy from food waste.
- The Agriculture Technology Center at the Maryland Center for Entrepreneurship was created in 2015 to support business development and incubation for agriculture technology companies. Five companies have joined the Center since that time, with one graduating.
- The County started an Agricultural Innovation Grant program for Howard County farmers in 2013 to support farm innovation. \$137,000 has been awarded to 36 projects with about 50 percent of these funds being matched by additional funding from MARBIDCO. The Program has inspired the creation of similar programs in several other Maryland counties.

OBSERVATIONS AND TRENDS TO WATCH

- Home to the MFCA and one of the most significant concentrations of food processing and distribution infrastructure on the East Coast in Jessup, MD.
- The equine industry is significant to the County's economy. The total asset value of the industry was \$414 million in 2010, and it generated \$5.8 million in capital expenditures.

LOUDOUN COUNTY, VA



\$37.1 M
Ag Sales

\$751 M
Economic
Impact



Farms: 1,396
Farmers: 2,328
Farmland:
134,792 acres



Ag Assessed Acres: 167,673
Preserved Farm Acres: 57,549
Farmland Value/Acre:
\$11,977



13
Farmers
Markets

15 CSAs



Community
Gardens: 2
School Gardens: 4



27 Breweries
40 Wineries
1 Distilleries
1 Cideries

MAJOR PRODUCTION CHANGES SINCE 2007

- 10 percent increase total market value of products sold.
- 48 percent Increase in corn, wheat, and soybean acreage.
- 29 percent decrease in hay acreage.
- 24 percent decrease in cattle and calves.
- 34 percent increase in laying hens.

FOOD AND AGRICULTURE ACCOMPLISHMENTS SINCE 2012

- Won a State award for Loudoun Farmer Trading Cards in 2016. That year, Loudoun County Economic Development distributed 87,000 farmer trading cards featuring 12 farmers to 55 Loudoun County Public Schools. The campaign is back for the third consecutive year in 2018 and has inspired other communities in the Washington Agricultural Region to do their own.
- Establishment of the New Ag School in 2017. It is an innovative hands-on program focused on agribusiness education, particularly in the areas of farming, agritourism, and hospitality.
- Placed almost 200 miles of fencing to protect streams from livestock since 1998.

OBSERVATIONS AND TRENDS TO WATCH

- Continued high level of equine activity. The county has more horses and ponies than any other county in Virginia.
- Exponential growth in farm wineries since the first opened in 1983. In 1999, there were six. In 2009, 16 were added. Since 2010 another 19 have opened.
- Steep growth in breweries is creating opportunities for local hops production. Three years ago, there were three farm breweries, today there are 28.

MONTGOMERY COUNTY, MD



\$48.3 M
Ag Sales

\$521 M
Economic
Impact



Farms: 540
Farmers: 962
Farmland: 63,493
acres



Ag Assessed Acres: 76,760
Preserved Farm Acres: 70,564
Farmland Value/Acre:
\$10,171



24
Farmers
Markets

15 CSAs



Community
Gardens: 15
School Gardens:
12



6 Breweries
5 Wineries
1 Distillery

MAJOR PRODUCTION CHANGES SINCE 2007

- 46 percent increase total market value of products sold in 2012
- Sales of grains, oilseeds, dry beans, and dry peas increased from \$7.2 million to \$20.6 million.
- 21 percent decrease in hay acreage.

FOOD AND AGRICULTURE ACCOMPLISHMENTS SINCE 2012

- Launched a Food Council in 2012, the first in the COG Region.
- Hosted *Farming at Metro's Edge* with Frederick County in 2013 and created a stakeholder report for supporting agriculture in the 21st Century.
- Passed an urban agriculture tax credit in 2017.
- Passed Bill 28-16 in 2017 to implement county food waste diversion goals by promoting food waste composting as an accessory use to farming.
- Received the American Planning Association's Planning Landmark Award in 2017 for creating the nationally unique, 93,000-acre Agricultural Reserve in 1980.
- Celebrated the 50th Anniversary and Recognition for Conservation Tillage in 2018.
- First county in the region to study food waste and make a public investment in food recovery.

OBSERVATIONS AND TRENDS TO WATCH

- Continued interest in agriculture from new and beginning farmers. The Office of Agriculture and its partners hope to offer the New Farmer Training Initiative again, which provides training and land access assistance.
- Growing number of smaller properties designated as agriculturally assessed, including a 3 percent increase in farms between 1 and 9 acres.
- Growing number of wineries. In early 2018, four new farm wineries were under construction.
- Growing number of farms offering agricultural education and agritourism activities.
- The horticulture and equine industries contributed \$154.3 million and \$84.8 million in economic impact respectively.

PRINCE GEORGE'S COUNTY, MD



\$18 M
Ag Sales

\$485 M
Economic
Impact



Farms: 500
Farmers: 547
Farmland: 32,607
acres



Ag Assessed Acres: 45,500
Preserved Farm Acres: 6,165
Farmland Value/Acre: \$7,889



16
Farmers
Markets

7 CSAs



Community
Gardens: 24
School Gardens:
23
Urban Farms: 9



3 Breweries
4 Wineries
1 Distillery

MAJOR PRODUCTION CHANGES SINCE 2007

- 86 percent increase in wheat acreage and 13 percent decrease in soybean acreage.
- 22 percent decrease in hay acreage.
- 41 percent decline in meat chicken inventory; 65 percent decrease in laying hen inventory.







FOOD AND AGRICULTURE ACCOMPLISHMENTS SINCE 2012

- Launched the Prince George's County Food Equity Council in 2013.
- Received Maryland Agricultural Land Preservation (MALPF) certification in 2014.
- Passed legislation in 2015 allowing retail food trucks back into the county.
- Passed urban farm legislation in 2016 allowing farming on 73 percent of land in the county.
- Passed an urban agricultural property tax credit in 2015 and launched *Bloomin' PGC* to support urban farming in 2016.
- Funded a permanent full-time Urban Soil & Water Conservationist to provide technical assistance to urban farms in 2018.
- Established the county's first wine trail (Legacy Wine Trail) in 2018.
- Quadrupled the capacity of the Western Branch Organics Recycling facility in 2018, making it the largest composting facility on the East Coast.

OBSERVATIONS AND TRENDS TO WATCH

- About 34 percent of Maryland's 200 African American farmers work in the county.
- A 2017 M-NCPPC survey revealed overwhelming interest from residents wanting access to land for urban agriculture. This desire has led to new hydroponic and aquaponics facilities. There is also tremendous interest in raising backyard chickens among residents.
- Growing number of agricultural education programs, farm venues, and farm stays.
- More farmers markets are accepting SNAP (food stamps) and offering matching programs. The County has been funding the Maryland Money Market program to increase food access.

PRINCE WILLIAM COUNTY, VA

	<p>\$12 M Ag Sales</p> <p>\$223 M Economic Impact</p>		<p>Farms: 330 Farmers: 500 Farmland: 35,638 acres</p>		<p>Ag Assessed Acres: 33,082 Farmland Value/Acre: \$8,827</p>
	<p>11 Farmers Markets</p> <p>7 CSAs</p>		<p>Community Gardens: 2 School Gardens: 58</p>		<p>7 Breweries 2 Wineries 2 Distilleries</p>

MAJOR PRODUCTION CHANGES SINCE 2007

- 21 percent decrease in corn for grain acreage, but 11 percent increase in corn for silage acreage.
- 21 percent increase in hay acreage.
- Doubled soybean production from 1,313 to 2,662 acres.
- 38 percent increase in cattle and calf production.

FOOD AND AGRICULTURE ACCOMPLISHMENTS SINCE 2012

- Formed the Agricultural and Forestal Districts Advisory Committee in 2015 to inform the Prince William County Board of Supervisors.
- Opened Farm Brew Live in 2017 as a destination brewery at the Manassas Innovation Park. It is an 8-acre campus featuring craft beer, craft food, and entertainment.

OBSERVATIONS AND TRENDS TO WATCH

- Ranks in the top three of sod producing counties in Virginia as of 2012.
- Has the largest alpaca inventory of any county in Virginia as of 2012.
- Ranks in the top 10 counties in Virginia for sales in sheep, goats, wool, mohair, and milk in 2012.
- Rapid decline in land available to farming due to development and subdivision.
- Growing number of agritourism opportunities involving craft beverage and on-farm events.
- Farms are increasingly small-scale, diversified, and focused on niche markets. Examples of niche products include hydroponic produce, turf grass, cut flowers, and CSAs.

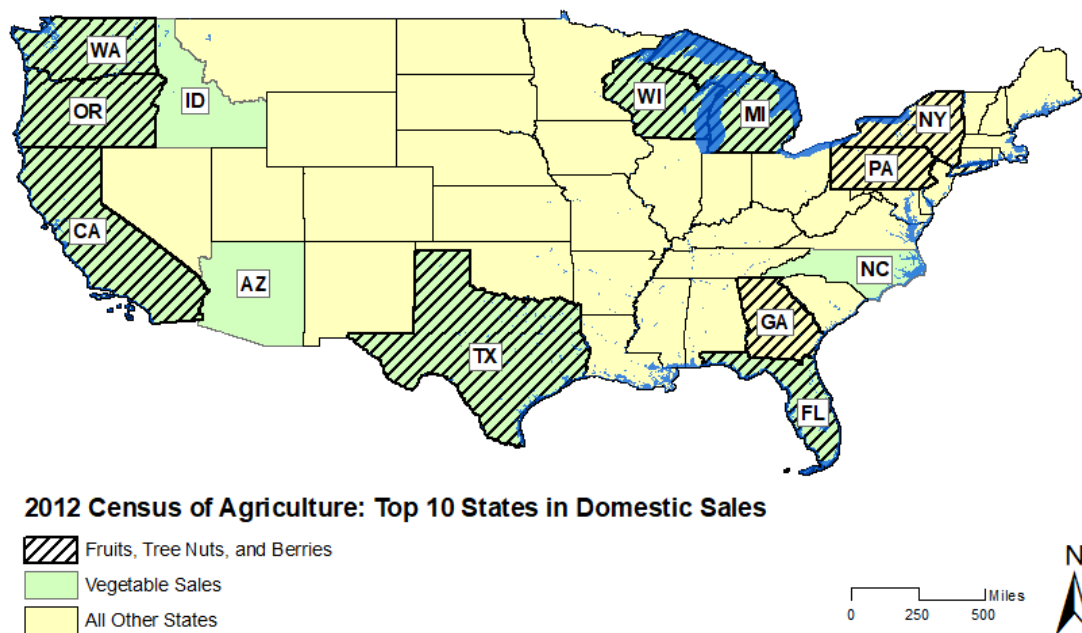
WHERE DOES MOST OF OUR FOOD COME FROM?

Local food production is inadequate to satisfy local food demand in most metropolitan areas around the country. This is true in the Washington Ag Region. High population, fewer agricultural lands, declining production, and other factors contribute to this. Furthermore, not all that is produced remains in the region. Farmers produce for local, regional, national, and global markets.

So where does most of the food consumed in the region come from? It is challenging to determine how much of the agricultural production remains here. However, production volume as compared to consumption needs indicates that the majority of what many people eat is produced in other states and elsewhere.

Agricultural production in the U.S. is highly centralized, with a few states producing the majority of specific agricultural products. A lot of the domestic produce in grocery stores can be expected to come from California, Washington, and Florida, which account for 78 percent of acres of fruits, tree nuts, and berries and 87 percent of sales.⁴² Much of the beef likely comes from Texas, Nebraska, Missouri, Oklahoma, and South Dakota, which account for 38 percent of the country's beef production.⁴³ Pork production is even more concentrated, with the top five states accounting for 70 percent of U.S. production.⁴⁴

Figure 16. Top 10 States in Domestic Sales: Fruits, Tree Nuts, Berries and Vegetables (2012)



Source: USDA NASS Census of Agriculture

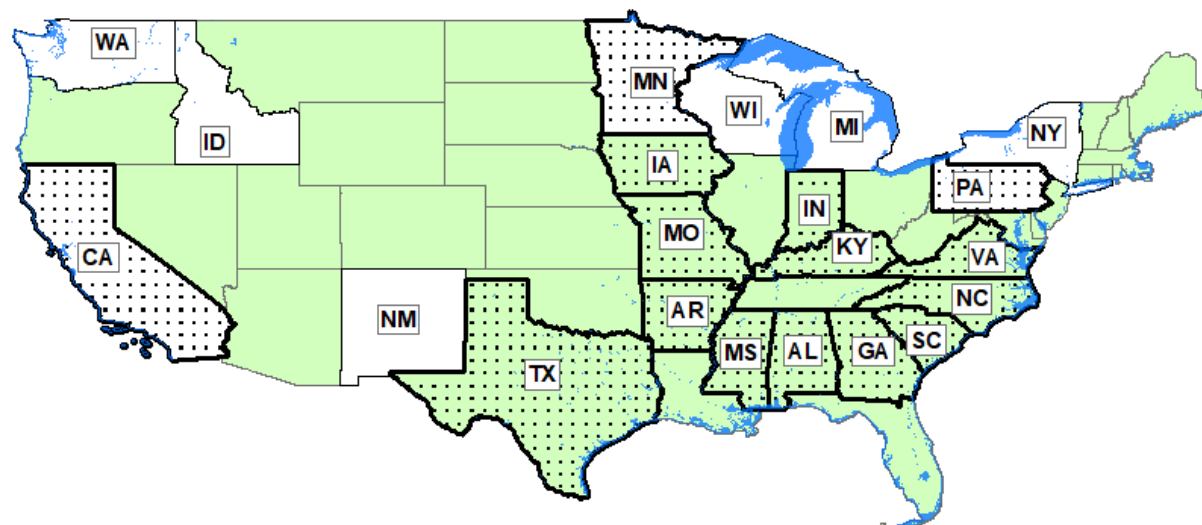
⁴² USDA, "Fruits, Tree Nuts, and Berries."

⁴³ USDA, "Cattle Industry."

⁴⁴ Pork Checkoff, "State Rankings by Hogs and Pigs Inventory."

However, Maryland and Virginia do produce some agricultural products in quantity even though they are generally not among the nation's largest. A lot of the poultry consumed in the region can be expected to originate in Maryland and Virginia. Meat chicken (broiler) production brings in the highest amount of cash receipts of any agricultural product in both states. Virginia ranks 10th in the nation in broiler production and 6th in turkey production.

Figure 17: Top 10 States in Domestic Sales: Milk, Poultry and Eggs (2012)



2012 Census of Agriculture: Top Sales of Milk, Poultry and Eggs



Source: USDA NASS Census of Agriculture

In addition, there are other crop categories that both states produce in volume. Virginia is in the top 10 producing states in the country for crops such as apples, grapes, and peanuts.⁴⁵ Cattle and calves were also the second highest grossing agricultural product in Virginia in 2016.⁴⁶ In the Washington Ag Region, Loudoun, Fauquier, and Prince William counties contain significant amounts of pasturelands and cattle inventory.

Lastly, some of the region's food is imported from outside of the United States. Imports have become increasingly important to meet growing demand. In 2015, U.S. agricultural imports equaled \$114.2 billion with 44 percent of imports consisting of *horticultural products*.⁴⁷ In the past, trade policies have influenced this by lowering or removing agricultural tariffs. Thus, greater amounts of imported fruits and vegetables (principally from Mexico, Latin America, Canada, and China) are entering local supermarkets.

⁴⁵ VDACS, "Agriculture Facts and Figures."

⁴⁶ VDACS, "Virginia's Top 20 Farm Commodities."

⁴⁷ USDA ERS, "Nearly Two-Thirds of U.S. Agricultural Imports Consist of Horticultural and Tropical Products"; USDA ERS, "Outlook for U.S. Agricultural Trade."

REGIONAL SELF-RELIANCE

Understanding where the region's food comes from is critical to developing strategies to build a more self-reliant food system. Under this system, as much of a region's food needs are produced, processed, distributed, and purchased within the region as possible. Another attribute is that significant economic and social returns accrue to all stakeholders in the region.⁴⁸ This is different than self-sufficiency, where the ideal is for everything consumed to be supplied from the region.

The increasingly concentrated nature of agriculture tends to hinder efforts towards self-reliance. Although, production was not always so heavily concentrated. The Delmarva Peninsula was once home to large numbers of fruit and vegetable farms, as well as processing and canning facilities.⁴⁹ Growing consumer demand for fresh produce, (once) declining truck transportation costs, and water subsidies in western states made farmers in California more competitive.

The region's agricultural future will be different than its present or past. With growing interest in local food, changing consumer tastes, and a greater awareness of resource limitations, many communities are investing to build more diverse, resilient, and abundant regional food systems. Understanding the past can inspire thinking about what the future could hold, including the opportunities that could position farmers for new or expanding markets.



Above and Left: Squash planting through harvest and storage at Shlagel Farms in Charles County, MD, a diversified fruit and vegetable farm growing for retail and wholesale markets in metropolitan Washington. (Karl Shlagel/Shlagel Farms)

⁴⁸ Ruhf and Clancy, "It Takes a Region...Exploring a Regional Food Systems Approach."

⁴⁹ Tassone, Bowen, and Bowen, "Health Safety, and Welfare?"

WHAT DOES OUR REGION GROW?

Increasing self-reliance in the region's food system requires knowledge of what is currently grown and consumed. The Washington Ag Region primarily produces corn, wheat, soybeans, and some produce. There is also some beef and dairy production, and minimal hog and chicken production.

Continued Decline in Food Production

For the basket of agricultural products examined by this report, food production continues to decline in the region, with decreases in fruit, vegetable, and livestock production. Vegetable production is down 31 percent from 1997 levels. Most food products have declined from anywhere between 30 percent and 85 percent. Notable production declines include apples, strawberries, sweet corn, wheat, chicken, pork, and dairy.

Table 6. Production Change in Washington Agricultural Region (1997-2012)

Food Item	1997	2002	2007	2012	Change	% Change
Fruits & Berries (number of acres)						
Apples ⁵⁰	N/A	4,530	1,958	1,778	-2,752	-61%
Blueberries	58	52	55	56	-2	-3%
Strawberries	230	129	43	34	-196	-85%
Vegetables (acres)						
Beans (snap, lima)	2,110	2,467	2,741	2,323	213	10%
Tomatoes	408	384	392	444	36	9%
Squash	62	152	93	91	29	47%
Sweet Corn	3,003	2,105	1,720	1,346	-1,657	-55%
Pumpkins	1,053	1,243	981	588	-465	-44%
Potatoes	125	164	205	181	56	45%
Grains (acres)						
Corn for grain	310,536	158,893	154,301	169,121	-141,415	-46%
Wheat	136,613	56,526	57,062	63,079	-73,534	-54%
Soybeans	313,104	147,285	121,900	163,409	-149,695	-48%
Livestock & Dairy (number of animals)						
Chicken ⁵¹	266,793	8,189	9,679	65,357	-201,436	-76%
Hogs	75,475	73,517	61,710	36,966	-38,509	-51%
Beef	181,076	156,150	127,188	119,166	-61,910	-34%
Dairy	89,552	64,673	49,185	44,041	-45,511	-51%

Source: USDA NASS Census of Agriculture

⁵⁰ 1997 data is unavailable. In this case, production change is since 2002.

⁵¹ Most of the decline between 2002 and 1997 in chicken production occurred in Prince George's County, MD per Census of Ag data.

Despite the declines, there are some areas of growth in grain and poultry production when looking at trends since 2002. Grain production increased 13 percent, while poultry increased 698 percent between 2002 and 2012. The increased chicken production is driven primarily by Frederick and St. Mary's counties in Maryland, and Fauquier County, Virginia. While a relatively significant increase in the Washington Ag Region, it is insufficient to support local demand.

Within COG jurisdictions, there also appears to be market opportunities in pork and honey to which farmers are responding. While the Washington Ag Region's hog production declined 50 percent, production in the COG jurisdictions increased by 70 percent. Additionally, honey production grew by 31 percent.

If the region hopes to become more self-reliant, there needs to be an examination of what would be needed to stabilize or reverse these declines. One anecdote related to production potential is that most members of the Regional Ag Work Group know farmers who are interested and willing to expand production. Current production should not be equated with capacity.

It is worth noting that how the foodshed is defined changes measures of self-reliance. Consider poultry production and demand for Maryland as an example. The poultry industry on Maryland's Eastern Shore more than meets Maryland consumer demand and is a net exporter. In *Maryland Grown: How What We Grow Compares with What We Eat*, Johns Hopkins Center for a Livable Future (CLF) estimated that in 2012, growers in the state produced about 580.5 million boneless pounds of chicken meat. Estimated consumer demand from Maryland residents for the same time was a little less than 325 million pounds.⁵² Therefore, despite the findings in [Figure 21](#) showing a large unmet demand for poultry in the Washington Ag Region, this is one example in which this information only partially captures regional production and fulfillment of an agricultural product.

Meeting the Demand

Although the Washington Ag Region produces a wide variety of food and fiber, local farmers are unable to meet the region's demand for most of the products examined. The only agricultural product that exceeds regional demand is corn for grain. Most of this grain is destined for animal feed.

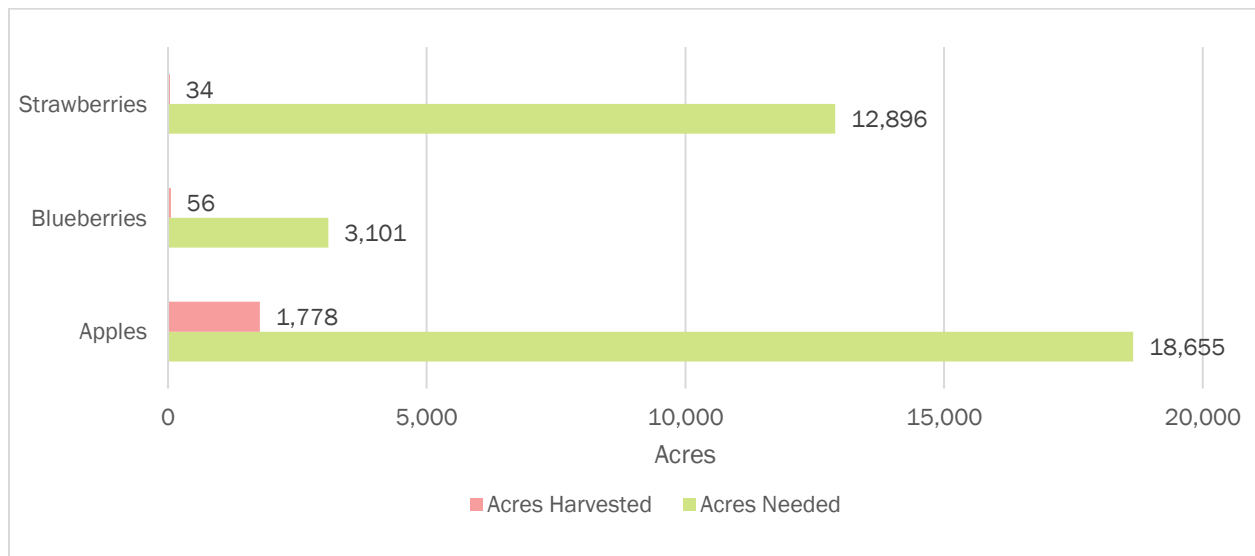
Among agricultural products ready for direct human consumption, only dairy came close to meeting local demand in recent decades. Unfortunately, the gap between production and demand is widening as more dairy farms go out of business in Maryland, Virginia, and the Northeast every year.

While it is not realistic to expect the region to become agriculturally self-sufficient, market deficiencies may offer new opportunities for expanding local food production, marketing, and sales.

The following charts compare 2012 production levels against regional demand the Washington Ag Region. Again, regional demand is not tied to consumption or nutritional needs but to average estimates of what U.S. residents purchase.

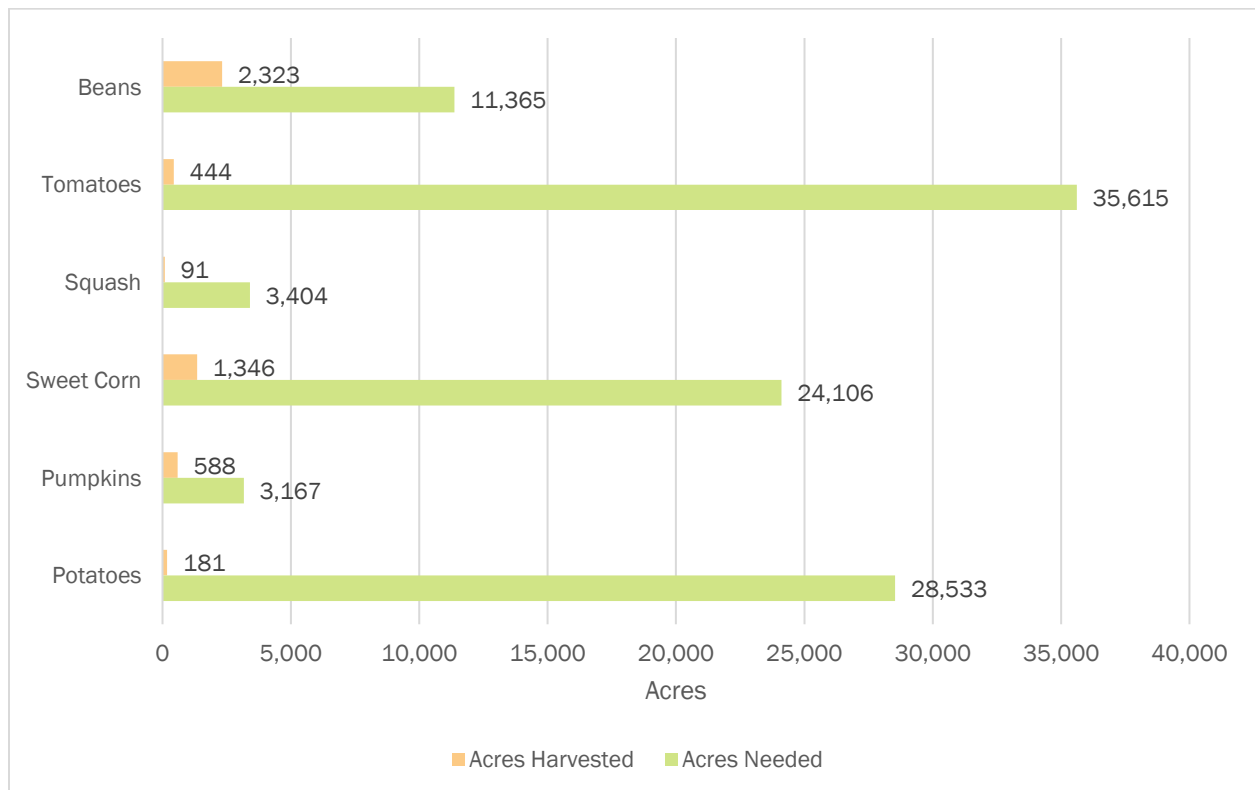
⁵² Johns Hopkins Center for a Livable Future, "Maryland Grown: How What We Grow Compares With What We Eat."

Figure 18. Fruit Production vs. Demand, 2012



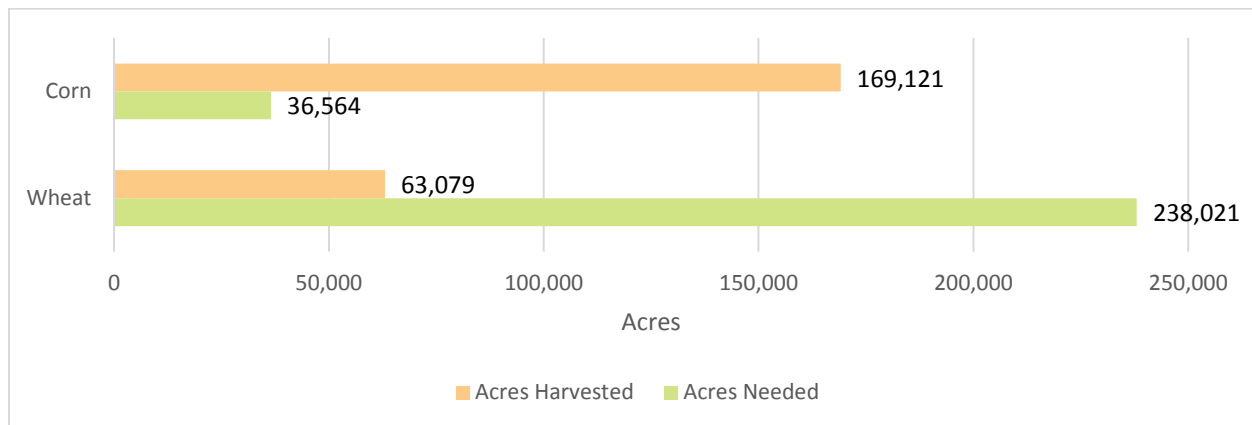
Source: USDA NASS Census of Agriculture

Figure 19. Vegetable Production vs. Demand, 2012



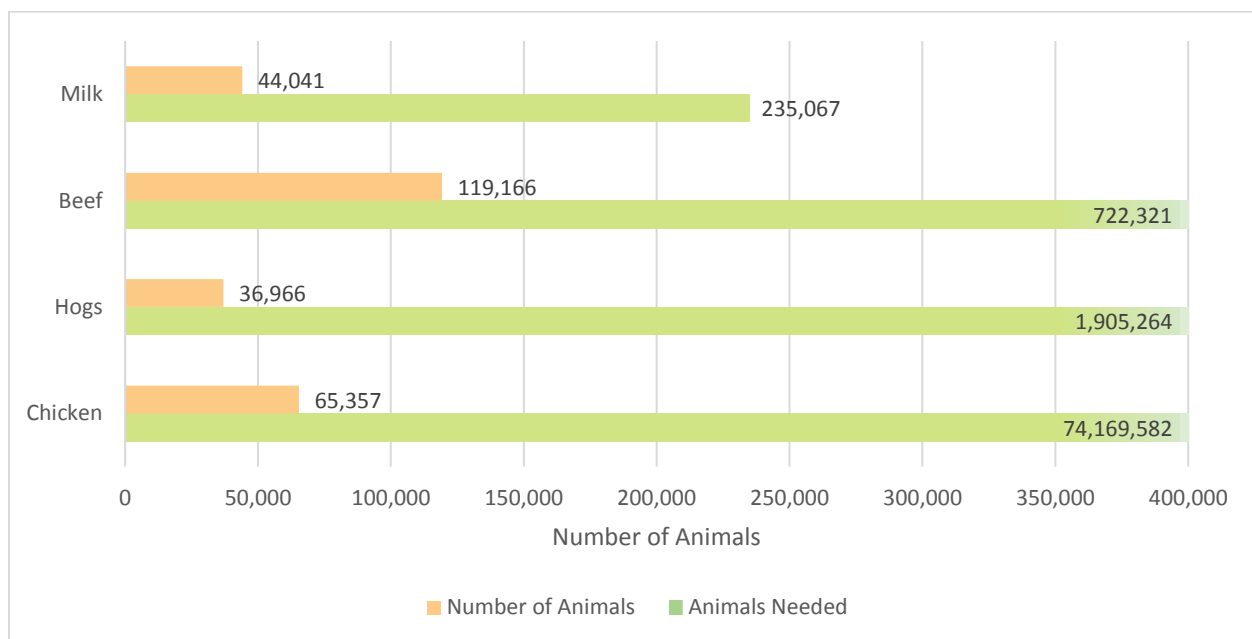
Source: USDA NASS Census of Agriculture

Figure 20. Grain Production vs. Demand, 2012 ⁵³



Source: USDA NASS Census of Agriculture

Figure 21. Livestock Production vs. Demand, 2012



Source: USDA NASS Census of Agriculture

⁵³ Comparison of soybean production to demand was left out because ERS did not provide any food availability data for soybean consumption.

UNDERSTANDING THE ANALYSIS

In 2012 when *What Our Region Grows* was first published, COG's Regional Ag Work Group used 2007 production data from the USDA and product demand data, based on estimates from the U.S. Food Market Estimator, to provide a snapshot of the region's estimated food production and demand. The Market Estimator has not been kept up to date.

The analysis in this update relies on many of the same data sources as the first report, like Census of Ag and the USDA's Economic Research Service (ERS) Food Availability Data System. The analysis presented here also uses more regionally specific data on crop yield for the Northeast and Virginia.

A major difference for how consumption is measured in this update to *What Our Region Grows* is by what people purchase, eat, and waste, not by what people eat alone, or should eat as recommended by nutritional guidelines. Reducing food wasted could have a positive impact on regional self-reliance.

In fact, it is based on the same methodology as The Center for a Livable Future used in its [Maryland Grown reports](#) to estimate production and demand.⁵⁴

A major difference for this report is how demand was measured: by what people purchase, eat, and waste, not by what people eat or should eat as recommended by nutritional guidelines. Using what people actually eat as a demand factor, or what nutritional guidelines recommend, would change the results and be more reflective of the methodology utilized in the first *What Our Region Grows* report.

The difference doesn't mask that the principal drivers of change in regional self-reliance include increasing population and declining production, and assumptions related to consumption.

A full description of the methodology used to **estimate** market demand versus agricultural production for select products in the region is provided in [Appendix A](#).

⁵⁴ The crop yield factors used in CLF's MD Grown reports, and in this report, were developed by a multi-state research team working on the 6-year Enhancing Food Security in the Northeast project. This USDA-funded Agriculture and Food Research Initiative (AFRI) project "seeks to determine whether greater reliance on regionally produced food could improve food access in low-income communities, while also benefiting farmers, food supply chain firms and others in the food system." The project is comprised of researchers, educators, entrepreneurs, and community leaders from a twelve-state region in the Northeast. More information is available on the project website: <http://agsci.psu.edu/research/food-security>

A Key Local Food in Crisis: Dairy

Historically, the dairy industry in the Washington Ag Region met annual local demand. Over the past several decades, the industry has experienced steady and significant declines in the number of farms. At the same time, improvements in animal genetics contributed to increased production from fewer numbers of animals. Many farms also added to their herds, which helped to keep production levels from precipitously declining as the number of farms decreased.

Unfortunately, today the Northeastern dairy industry is in crisis and more dairy operations continue to close in the Washington Ag Region and beyond. The number of animals milked in the region also continues to decline.

The contribution of dairy farms to local food economies is sometimes overlooked or forgotten despite their record of providing a healthy, complete protein to surrounding areas for generations.⁵⁵ They are critical to local agricultural economies and keeping land in farms. Many dairy farms are several hundred acres in size, which allows farm families to raise feed for their herds. Very few, new dairy farms producing for wholesale distribution have opened in the Washington Ag Region in the last 50 years due to market uncertainty and the large capital investment required.

Remaining dairy farms are typically multi-generational and represent an important way to maintain agricultural knowledge and culture. Because of the number of dairies that used to exist in the northeast, including in the Washington Ag Region, it is not uncommon for farmers and non-farmers to have had a parent or grandparent who was a dairy farmer.

The financial difficulty that dairy and other farmers are facing across the country is raising alarms in the agricultural and the public health community about the toll that it is taking on farmers and farm families. There is concern that prolonged difficulty and uncertainty is leading farmers to take their own lives. Although it is challenging to document the full range of impacts that are happening in the region, several technical assistance providers are piloting new efforts to address mental health in the agricultural community.

In Maryland, the Maryland Association of Soil Conservation Districts recently received funding to “put on a series of workshops across the state in 2019 to train people on the early warning signs of severe mental stress and substance abuse.”⁵⁶ The University of Maryland Extension also created a Farm Stress Management website in 2018 to provide information on available financial, mental health, and legal resources for the agricultural community.

THE NUMBER OF DAIRY FARMS CONTINUES TO SHRINK

In 2012, there were 520 dairies compared to 557 in 2007 and 605 in 2002 in the Washington Ag Region. Maryland dairies continue to account for a majority (77 percent), with most of these located in Frederick and Washington counties. Data that is more recent provides additional evidence of the crisis. Between 2012 and 2017, an estimated 715 dairy farms in Maryland and Virginia have closed, which is a loss of about 120 farms per year.⁵⁷

⁵⁵ Gardner, “Drinking Milk Is a Political Act.”

⁵⁶ Hogan and Mongilio, “The Hidden Loss: Maryland Farmers Confront Rising Suicide Rates.”

⁵⁷ This number is derived from a comparison of different data sources. USDA NASS Census of Agriculture data for 2017 will be available later in 2019, at which time this figure may be revised.

The size of dairy farms is also changing. [Table 5](#) shows that farms with 20 to 199 dairy cows declined significantly in Maryland and Virginia. Although fewer in number, larger dairies with 500 or more cows grew by 35 percent. In 2012, seven of these had more than 1,000 cows per farm.

Table 5. Dairy Farms by Herd Size in Maryland and Virginia

Number of Cows	2002	2007	2012	% Change (2012 vs. 2007)
1 to 9	672	429	571	-15%
10 to 19	90	71	85	-6%
20 to 49	280	282	192	-31%
50 to 99	700	450	396	-43%
100 to 199	502	426	353	-30%
200 to 499	141	138	117	-17%

Source: USDA NASS Census of Agriculture

This is perhaps the most visible loss of local, medium-size farms in and around the Washington Ag Region. As will be discussed subsequently, some farmers are able to take advantage of direct marketing opportunities such as micro-dairies and on-farm creameries.

These trends also suggest a shift towards a fewer number of large dairies. In recent years, many smaller dairies stayed in business in part because of larger, neighboring operations. Dairy cooperatives (co-ops) need a certain concentration of farms and production volume within a service area for it to be profitable to collect milk on a near daily basis for processing. As more dairies close, it becomes even more difficult for small dairies to stay in business, especially if they are geographically dispersed. Unless there is a direct market opportunity where the farm can take advantage, these operations may have no option but to change to some other kind of agricultural production or close.

WHAT IS DRIVING TODAY'S CRISIS?

Several factors to track include milk prices, international trade, and feed production costs. Milk prices have been historically volatile, which impact production decisions and profitability. When milk prices peaked at \$25.70 per *hundredweight* (cwt) in 2014, farmers responded by increasing production. The resulting higher milk supplies pushed prices down in 2015. Purchase prices for milk have remained below the cost of production for many farmers ever since. Although the industry has been cyclical in the past, and prices may rise this winter, many farms simply cannot sustain four years of financial losses.⁵⁸

Changes in exports and imports also influence domestic prices. Fewer exports or more imports of other dairy products can depress prices.⁵⁹ The threat of cheaper, non-regional milk and other dairy products could also flood the market and put local dairies out of business.

⁵⁸ Fabris, "Virginia."

⁵⁹ Stewart et al., "Processing and Marketing Blunt the Impact of Volatile Farm Prices on Retail Dairy Prices."

Poultry and Grain: A Regional Relationship

The Delmarva Peninsula poultry industry requires significant amounts of corn, soybean, and wheat. In 2016, it purchased 85.4 million bushels of corn, 35.5 million bushels of soybean, and 1.7 million bushels of wheat.⁶⁰

The size and demand of this nearby industry drives production in Maryland and Virginia. It is not surprising that 34 percent of all harvested cropland in the Washington Ag Region is dedicated to grain production. Since the Eastern Shore grain producers are unable to meet demand, grain farms on the Western Shore are critical to this regional supply chain. Without alternative market opportunities, a decline in the industry would threaten the future of the region's grain farmers particularly at a moment of great uncertainty in international markets.

There are several trends in the Delmarva poultry industry. It should be noted that although overall output is down from a high in the mid-1990's, the industry is still growing, which might be driven by construction of new poultry houses that have larger capacity. Once the 2017 Census of Ag data is available, the Delmarva Land & Litter Challenge (DLLC) is expected to publish a report on the state of the poultry industry. This effort is expected to provide a fuller picture of how the industry is changing.

Poultry Terminology

In poultry production, chickens are classified as broilers or layers. Broilers are male and female chickens raised for meat. Layers are female chickens raised for eggs. In smaller-scale operations, this distinction may not exist.

⁶⁰ DPI, "DPI Facts & Figures."

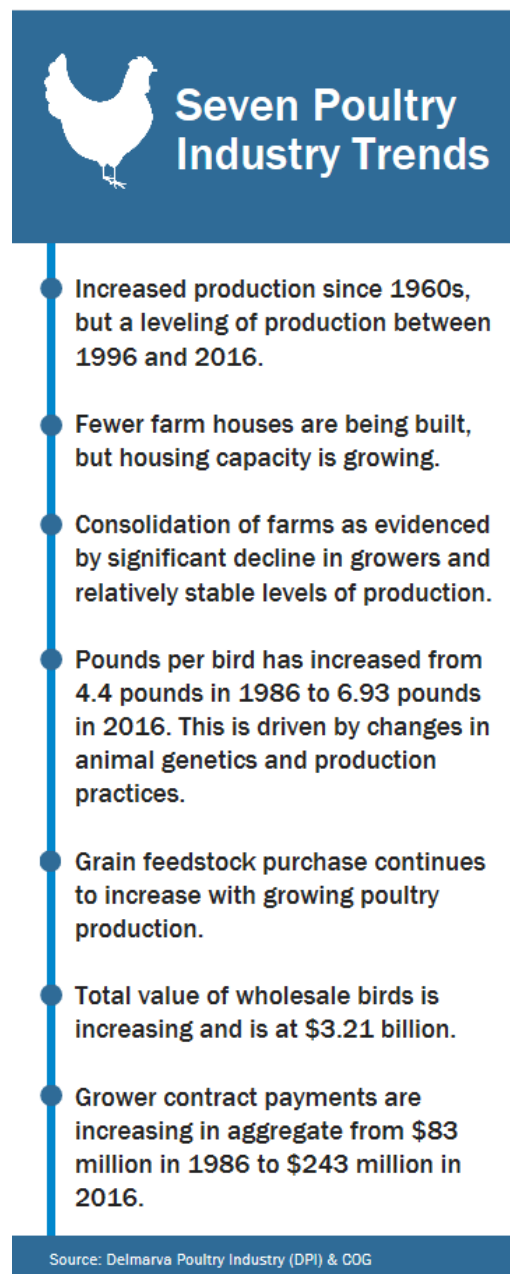
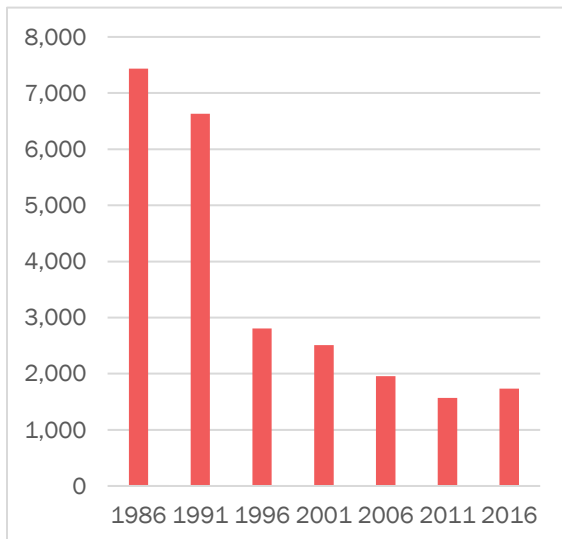
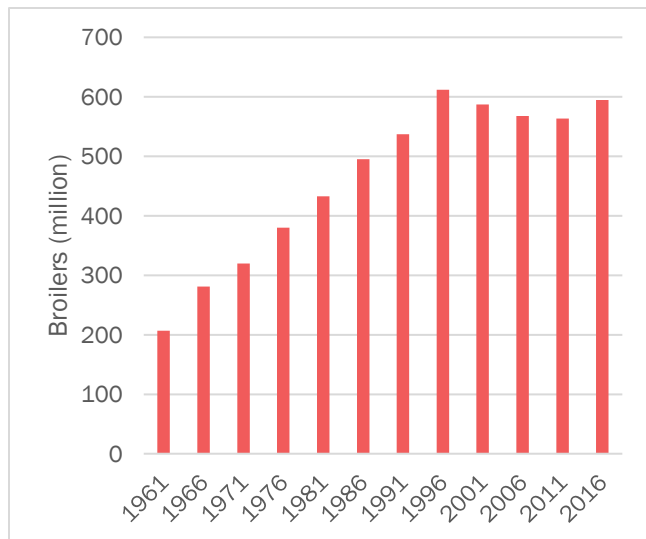


Figure 22. Declining Number of Poultry Growers



Source: Delmarva Poultry Industry, Inc.

Figure 23. Growing and Stabilizing Broiler Production



Source: Delmarva Poultry Industry, Inc.

POULTRY PRODUCTION AND PROCESSING IN THE WASHINGTON AG REGION

Poultry operations in Washington Ag Region are primarily small-scale operations. Many of these farms also raise other livestock. In 2012, 187 poultry operations averaged 350 chickens per farm. Furthermore, no county had more than 19,000 chickens in the region. In contrast, poultry houses on the Eastern Shore can house 20,000 to 50,000 birds per house in a year.

There is no aggregated regional data on where all the chicken raised in the Washington Ag Region is sold. Some of these farms sell through direct-to-consumer channels at retail prices, a benefit of proximity to high-value markets. This includes on-farm sales, farmers markets, and CSAs. Additionally, others may sell to restaurants and institutions.

With respect to animal slaughter and processing, given the small-scale, it is likely many of these farms qualify for federal exemptions under the Poultry Products Inspect Act. In general, the law exempts operations that slaughter or process fewer than 20,000 poultry per year of own production from continuous USDA inspection. However, states have their own laws regarding the slaughter, processing, and marketing of this poultry.

Maryland, Virginia, and Pennsylvania all have state inspection processes in-place for producers selling farm-raised and processed poultry to customers within their states off the farm. In some cases, regulations differ for producers raising and processing under 1,000 birds. However, regardless of number, farmers selling poultry across state lines must have their animals processed at a USDA inspected facility. This can be challenging for farmers transitioning from on-farm processing to inspected facilities given the added time, logistical challenges, and costs.

REGIONAL AGRICULTURAL CHALLENGES AND LOCAL SOLUTIONS

Agriculture has a significant economic impact in Maryland and Virginia. In 2015, it employed 65,000 Marylanders⁶¹ and 334,000 Virginians⁶² and generated statewide economic impacts of \$15.8 billion and \$70 billion dollars respectively.

COG Region: Economic Impacts of Food & Agriculture

\$5.47 B

District of Columbia

Total value impact of production, distribution, grocery, restaurants, & support industries.

\$2.9B

Maryland (COG Jurisdictions)

Economic impact of agriculture, forestry, aquaculture, & support industries.

\$2.23 B

Virginia (COG Jurisdictions)

Economic impact of agriculture & forestry.

Maintaining Profitable Enterprises

Maintaining profitability over time is one of the largest challenges farmers face. As noted earlier, many farmers must supplement or subsidize their farm operations with other sources of income.

Farming is not cheap, and many farmers are receiving a declining portion of every dollar spent on food. A recent blog post from Virginia Farm Bureau notes that dairy, grain, and beef cattle farmers have been particularly impacted by declining prices.⁶³

Aside from purchasing or renting land, farmers may need additional equipment and infrastructure. Capital access can hinder aspiring farmers from getting started. Market conditions, volatile commodity prices, and changing consumer preferences pose significant challenges. If people do not see farming as profitable, it can discourage growth in agriculture.

Real Estate Value and Land Access

High land prices in the region, primarily a function of development and competition for desirable land, make it cost prohibitive for many new and beginning farmers to purchase land. Development pressure causes land prices to rise, which leads to farmland being sold as farmers retire. As more farms are sold, land prices continue to grow to reflect commercial and residential uses.

High land prices do not just make it hard for beginning farmers to purchase or rent land. It also makes it difficult for farmers to expand existing operations which some need to do to maintain a viable business. Over time, farmers' ability to compete with commodity producers in other states

⁶¹ Diriker, Guy, and Chambers, "The Impact of Resource Based Industries on the Maryland Economy."; This number includes crop production, animal production and processing, commercial hunting and trapping, and other industries that rely on this sector for supply-chain inputs. Equine is also included. Seafood and aquaculture are reported separately in terms of economic contribution and jobs (3,341).

⁶² Rephann, "The Economic Impact of Virginia's Agriculture and Forest Industries."; These numbers do not include forestry.

⁶³ VAFB, "Farmers' Share of Food Dollar Reaches Historic Low."

with lower land prices could decline due to constraints on scaling operations.

In some communities, leases may be one of the few viable options for new and existing farmers. There are good examples of leasing arrangements that have yielded great benefit to farmers and landowners. However, leasing has its own challenges related to land tenure security, transportation and distance between properties, etc. Furthermore, many farmers aspire to steward their own property. That said, there are several recent, local success stories of young farmers purchasing their own properties with support from public funds. Increasing support for programs to connect new farmers to land, and to link landowners and farmers to lease or sell land, is a prudent investment.



A farm in Prince George's County that was purchased with support from MARBICO's Next Gen Farmland Acquisition Program. (Prince George's County Soil Conservation District)

Seeing the growing need for financing and other strategies to connect new farmers to land and promote farmland conservation, the Maryland Agricultural & Resource-Based Industry Development Corporation (MARBIDCO) launched an innovative, [Next Generation Farmland Acquisition Program](#) in 2017.

Through this program, new financing coupled with preservation programs lower the cost of purchase for eligible properties and farmers. MARBIDCO pays up to 51 percent of the fair market value of the farmland (capped at \$500,000). The funds are used as a down payment at settlement, with MARBIDCO taking an option on a preservation easement purchase. This also enables a commercial lender to make a loan if necessary to help the farmer with the purchase. The farmer has several years to sell the permanent conservation easement on the farmland and repay the down payment.

Farmland Fragmentation

Land subdivision and development have caused *farmland fragmentation*. This results in the loss of prime farmland and dampens economies of scale. Not all soil is created equally. Flat, mineral rich, well-drained soils are a finite resource. Once converted to other uses, this irreplaceable natural resource is gone.

As farms are pushed to the fringes to make way for development, remaining farmers must travel greater distances to reach markets or agricultural support services. This means more hours worked, increased fuel costs, and decreased profits. Residential development into areas once predominantly agricultural also creates potential conflict. Many residents are not accustomed to (or do not understand) the sights, smells, and sounds of working farms.

It is important to manage growth to avoid negative impacts to agriculture. In some places, a mindset persists that agricultural land is just vacant, not being used to its highest potential. This is not the case.

Farmland provides a great deal of value to communities, including fiscal savings when looked at from a “Cost of Services” standpoint.⁶⁴ Agricultural land generally requires far fewer local services such as schools, fire, police, public water and sewer, roads, and other infrastructure. Typically, residential land tax revenues do not cover service costs. Agricultural land tax revenues exceed them. Maryland and Virginia both recognize the service costs associated with different land uses. This is reflected in differential assessment rates, including lower rates for agricultural land.

Farmland Preservation

Land preservation is critical to protecting the future of agriculture. There is no farming without farmland, even with innovations occurring in climate-controlled agriculture. Without land permanently preserved for farming, discussions advocating for food security, food access, agritourism, and the economic benefits of agriculture are unproductive.

The range of farmland preservation tools and programs in the Washington Ag Region could be the subject of an entire report. Decision makers, landowners, and community members evaluate numerous considerations when designing and financing programs. One important consideration is what agricultural activities will be allowed to take place on a property placed under easement. For many landowners, it is critical to continue to run the farm as a business while protecting agricultural soil and the long-term investment made in land preservation.

Based on available data, an estimated 646,909 acres of *privately owned* acres are under protection or easement in the Washington Ag Region. A detailed table of jurisdictions, private acres under easement and publicly owned land, as well as land conservation programs and tools, can be found in [Appendix E](#).

Public and nonprofit land preservation programs prioritize properties containing desirable attributes (i.e. high-quality soils) and administer available resources among interested property owners accordingly. There are a range of programs in use in the Washington Ag Region, including locally funded **Purchase of Development Rights Programs** (PDR), market-based **Transfer of Development Rights Programs** (TDR), and donated easements, which provide tax benefits.

⁶⁴ See American Farmland Trust’s website for numerous studies on the reduced cost of services to agricultural lands. One caveat is that cost of service ratios change with significant public investment in land preservation.

Farmland preservation programs depend on several factors including funding availability, and state of the local economy and the real estate market. One major way that publicly financed preservation programs are funded is through **agricultural transfer taxes**. These are taxes paid by landowners who convert farmland into non-agricultural uses. As farmland preservation expands, there are fewer farm conversions over time. This system has its strengths but poses a dilemma for future easement acquisitions funded with transfer tax alone.

Montgomery County, Maryland is a good case study in successful land preservation and the challenges to maintaining needed momentum. The county has 52,000 acres protected through its TDR program, however, there are some properties, which retain some development potential. There are also over 10,000 acres in unprotected, agriculturally assessed land. Agricultural transfer taxes have declined. Since the Great Recession, the county has collected about \$1.6 million (FY 2011 to FY 2017). This funding would only purchase the development rights on an average of 34 acres each year at \$7,000 per acre easement value. Without sustainable funding, the county cannot purchase additional easements through its local preservation programs.



Fauquier County has one of the most successful Purchase of Development Rights Programs (PDR) in Virginia. Since 2002, the county has financed the purchase and protection of 13,000 acres of land through PDRs. This large dairy farm in Southern Fauquier is one of the many farms protected through the program. (Fauquier County Agricultural Development Department)

Loss or Lack of Agricultural Support Services, Including Infrastructure

As farming in the region has declined and broader market consolidation has occurred, many of the required support services such as repair shops and equipment dealers have closed, moved further out, or reoriented their business to the suburban homeowner.

The most recent economic impact study for Virginia agriculture indicated that farmers are now making some number of agriculturally related purchases online.⁶⁵ The extent to which this may also be driving change in available support services in farm communities is an interesting question.

There is also an on-going lack of appropriately- scaled, accessible infrastructure for small farmers. Much of the infrastructure and supply chain (aggregators, distributors, processors, and marketers) is not designed to serve them or regional market channels; however, this is an area of growing interest and study.

Post-Recession, tighter government budgets reduced the amount of money available for agricultural programs such as cooperative extension programs, services, and personnel. This continues to be a concern in some jurisdictions in the Washington Ag Region, while others report that support for extension has rebounded. Although investments may be reaching pre-Recession levels, assessing the adequacy of these support services for enhancing regional resilience and supporting urban farms requires further research.

Meanwhile, there have also been some modest investments in agricultural marketing development staff to support farm businesses. In 2017, Charles County hired its first agricultural marketing specialist, joining other Maryland and Virginia counties that recognize the importance of supporting farmers, ranchers, and food and beverage entrepreneurs with specialized expertise as they develop their businesses and navigate local regulations.

Local Meat Slaughtering and Processing

Unfortunately, there are not enough USDA-inspected slaughterhouses to support the local food economy. The reasons are historical and regulatory. In 1967, Congress passed the Wholesome Meat Act, which required producers to use USDA-inspected facilities to sell across state lines. The results were mass consolidations.⁶⁶ By January 1, 2017 there were only about 814 federally inspected slaughterhouses in the U.S.⁶⁷ Not surprisingly, ensuing regulations were designed for large facilities and may be unsuited for small-scale facilities.

One result of the loss of support services is that some of the region's livestock farmers must take their animals to Pennsylvania, or as far away as North Carolina, for processing; adding time and expense to production costs.

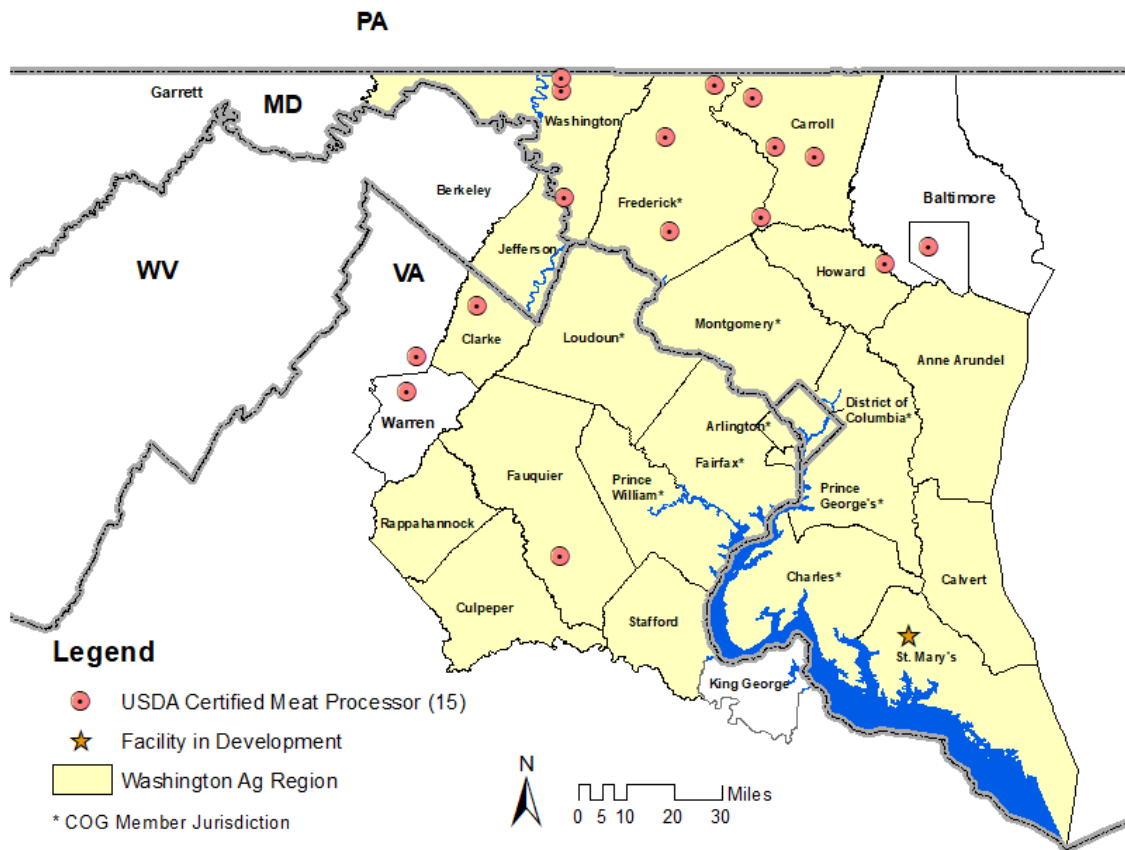
Consumers are increasingly demanding meats from small producers, with expectations of sustainably raised and humanely processed meats, and regional farmers seem to be responding. However, many of these farmers are unable to quickly and efficiently meet demand due to the lack of small-scale slaughterhouses.

⁶⁵ Rephann, "The Economic Impact of Virginia's Agriculture and Forest Industries."

⁶⁶ Ayala, "Congress Can Level the Playing Field for Small Farmers."

⁶⁷ USDA NASS, "Livestock Slaughter 2016 Summary."

Figure 24. Meat Processing Facilities in and around the Washington Ag Region



Small producers favor local facilities such as *custom slaughterhouses*. However, these are less regulated and do not allow for commercial sales. Legislation proposed in Congress in the past could change this. The Processing Revival and Intrastate Meat Exemption Act (PRIME Act), would allow intrastate sales of custom-slaughtered and -processed meat. Like the federal exemption for small-scale poultry production, this could ease federal regulations to make it easier to process meat and sell it within the state where it is produced. Advocates do not believe that health and safety would be compromised.

Some communities are making attracting new meat processing facilities a priority. For example, the Southern Maryland Agricultural Development Commission (SMADC) is currently working with local business owners who are in the process of opening a new, USDA inspected slaughter facility for a part of the state, which currently has none. Additionally, SMADC is soliciting the development of a project that will work with the slaughterhouse to provide “cut and wrap” and value-added meat products, as well as opportunities for other types of value-added agriculture.



Soon to be open USDA inspected slaughter facility in Southern Maryland. (Lena McBean/Edwin Remsberg Photography)

Federal, State and County Regulations

New sets of federal, state, and local regulations often make it costly and time consuming for farmers to construct new buildings, drill new wells, or build new irrigation ponds and farm.

State Total Maximum Daily Load (TMDL) requirements for the Chesapeake Bay watershed require farmers to develop and implement nutrient management plans. Compliance requires that many install new manure storage sheds and treatment systems, fencing to keep livestock out of streams, buffered waterways, and other nutrient reduction techniques. As indicated earlier in the report, these practices are contributing to a healthier Chesapeake Bay.

Applying Best Management Practices – Before and After



The Piedmont Environmental Council helped restore water quality to an impaired waterway on a cattle farm in Loudoun County, VA through fencing, alternative watering systems, and better crossings for animals. The aerial photo shows how the efforts have helped create a riparian buffer between the pasture and Howser Branch. (Top) As a result, the flooding at the Howser Branch crossing was significantly reduced. (Bottom Left vs. Bottom Right) Most importantly, the E. coli count went from exceeding the impairment standard 81 percent of the year to being below the standard 61 percent of the year. (Piedmont Environmental Council)

Farmers in the region continue to work to improve environmental and water quality through the implementation of best practices for nutrient management. In some communities, requests for technical assistance and financial cost-sharing programs, outstrip available supply.

ZONING AND BUILDING CODE REGULATIONS

Zoning regulations can either support or restrict agriculture. While zoning has been used as a primary tool to preserve agricultural lands in some jurisdictions, it has also posed obstacles for farms. In the Washington Ag Region zoning and building codes have had unintended negative consequences on farming as counties have become more urban and implemented regulations favoring residential uses rather than agricultural ones. In other cases, the farm businesses have evolved faster than regulations.

Here are some recent examples of zoning regulations that restrict agriculture:

- Requiring breweries to operate in industrial zones and restricting on-farm breweries.
- Building height restrictions that require farmers to seek variance for building silos or barns.
- Requiring repurposed farm structures used for limited activities to comply with commercial or industrial building codes.
- Restricting on-farm activities like meat processing, operating a creamery, food packing, and the size and operation of farm stands.



Example of one of the region's many grain farms. View to Sunny Ridge Farm in Montgomery County, MD. (Jackie Arnold/Montgomery County Office of Agriculture)

Several jurisdictions in the region report making progress in creating more farm-friendly zoning and policies for agriculture – both urban and rural – since 2012. Zoning regulations should support keeping land in agriculture and allowing for a range of activities. Policymakers should consider:

- Zoning that allows flexibility to produce and sell products such as pickles, cheese, wine, flour, and local timber on-farm.
- Agricultural zones that allow for processing and storage facilities.
- Zoning that allows for various forms of agritourism.

Finally, there is growing interest in urban agriculture. Counties such as Arlington and Fairfax already have legislation and zoning codes that allow urban agriculture. Demand from residents is also driving changes such as allowing farmers markets in residential zones.

Recently, the District of Columbia, Montgomery County and Prince George's County have also passed legislation aimed at increasing the range of locations and permitted activities for urban farmers.

These jurisdictions have also passed tax credits for private property owners using or renting their land for urban farming. The first of these new laws was passed in 2014 in DC.

Table 8: Urban Agriculture Tax Credits in the COG Region

Jurisdiction	Year Passed	Maximum Annual Credit	Annual Cap	Terms and Conditions
District of Columbia	2014	90% tax abatement	\$400,000 in FY16, \$350,000 in following years	Applies to vacant or underutilized land in any zone where urban agriculture is allowed. For urban farming, property must be at least 2,500 square feet of land under active use and cultivation; private properties are also eligible. Applies to rooftops and indoor growing in the future.
Montgomery County, MD	2017	80% tax abatement, up to two, five-year terms	n/a	For urban agricultural properties in residential zones less than 3 acres, used solely for urban agricultural purposes. Tax credit is limited to those properties with more than \$5,000 in gross income from the sale of products grown or raised there. Property must be in or within 1,000 feet of the county's 10 Metro Station Policy Areas.
Prince George's County, MD	2015	\$5,000	\$100,000	Qualifying properties must be zoned for urban farming, between 1/8 and 5 acres, located in a Priority Funding Area, and generate at least \$2,500 in annual revenue.

Source: Regional Agricultural Working Group and Metropolitan Washington Council of Governments

NEW REGULATIONS

In 2011, the Food Safety Modernization Act (FSMA) was signed into law in response to growing concerns on food borne illnesses and bioterrorism. The FSMA Produce Safety Rule set the first-ever federal regulatory standards for the production, harvest, and handling of fruits and vegetables. While it serves the greater good, smaller farms could be especially challenged with additional expenses to stay in compliance. Large farms may be able to hire staff to oversee food safety; however, smaller farms often do not have the resources.

Cooperative extension Services, State Departments of Agriculture, food hubs (i.e. Local Food Hub, Chesapeake Harvest, etc.) and farmer organizations in the Mid-Atlantic like Farm Bureau, Future Harvest CASA, and Pennsylvania Association of Sustainable Agriculture have been working to provide a range of support to farmers to become GAP (Good Agricultural Practices) certified, a market driven requirement of many wholesale buyers that shares similarities to FSMA. It's expected that these organizations will continue to provide support as the regulatory requirements of FSMA go into effect.

Availability and Cost of Key Inputs: Labor and Housing

Farm labor is a major concern, especially for growers depending on manual harvesting. Some farms develop apprentice systems with interns, while others hire foreign guest workers temporarily through the H-2A visa program.⁶⁸

The H-2A application is lengthy and expensive. Participating farmers provide housing, food, and transport to work for these seasonal laborers in addition to wages. Recently, federal changes to how H-2A visas are allocated has led to agricultural worker shortages, such as in the Maryland crab industry.⁶⁹

American Farm Bureau (AFB) has worked for years to raise the visibility of the critical role that foreign labor plays in American agriculture. In one recent estimate, AFB reports “increasing immigration enforcement without also reforming our worker visa program will cost America \$60 billion in agricultural production.”⁷⁰

Not everyone believes that reforming the H-2A program alone is the answer to finding a capable work force to help America’s farmers. Nationally, abuses and exploitation of foreign and immigrant workers does occur irrespective of legal status.⁷¹

Some farms, Amish and Mennonite family farms especially, rely on family labor.⁷² Without these farm families, the regional food supply chain would look dramatically different. Currently, the contributions and challenges these communities may face are not well understood in the metropolitan region.

Finally, affordable housing seems to be a challenge that persists across the region’s urban, suburban, and rural communities. On-farm housing is generally not a part of the conversation, but it should be.

⁶⁸ In 2016, Maryland had 804 H2A workers compared to 639 in 2012. Virginia had 3432 H2A workers in 2016 compared to 2161 in 2012.

⁶⁹ Dance, “Crab Crisis: Maryland Seafood Industry Loses 40 Percent of Work Force in Visa Lottery.”

⁷⁰ American Farm Bureau, “Agriculture Labor Reform.”

⁷¹ Felter, “U.S. Temporary Foreign Worker Programs.”

⁷² The Regional Agricultural Work Group has seen no comprehensive study of the contributions of Amish and Mennonite family farms to the region’s local food economy. It is assumed to be very significant given the output and proximity of large communities in southern Pennsylvania, Virginia’s Shenandoah Valley, and to less extent, southern Maryland. Communities such as Lancaster County, Pennsylvania and the rural counties in the Shenandoah Valley (i.e. Rockingham, Augusta, etc.) are among some of the most agriculturally productive and diverse in the Mid-Atlantic.

Climate Change and Soil Health

Farming is significantly impacted by weather and climate. Climate research indicates that the region will experience warmer, unpredictable, and more extreme weather. This can adversely impact agricultural production. For many farms, increased prevalence of weeds, pests, and diseases due to warmer and more humid weather will add to operating costs and cut yields.

Within the region, the U.S. National Climate Assessment finds that heat stress will adversely affect livestock industries in Virginia as temperatures rise over this century.⁷³ Similarly, agriculture in Maryland will feel the impacts of elevated heat levels, droughts, increased flooding, and unpredictable and severe weather patterns. Maryland farmers are already experiencing warmer winters and summers, wetter autumns and springs, and dryer summers.

Unfavorable weather can cut yields significantly. Increased frequency of such weather negatively impacts food security along the entire supply chain by affecting the availability, affordability, and accessibility of food. Recognizing that these changes will impact agricultural production, the economy, and farm viability University of Maryland Extension now dedicates one of its specialists to helping farmers reduce the risk that climate change poses. Ultimately, improving the rates of adaptation for farmers and other food supply chain actors through research, technology, management practices, and innovation will be critical for regional resilience.



Farms practicing crop rotation or cover cropping often rotate fields in and out of production. Due to record amounts of rain and subsequent flooding in 2018, Dicot Farm in Charles County, MD had to plant on the field to the left of the high tunnel in the top picture. The bottom picture shows that the land was intended to be left fallow as in previous years. (Dicot Farm)

A focus on soil health and rebuilding degraded soils can improve on-farm resilience and mitigate environmental risks for farmers. Healthy soils also provide a carbon sink, and improve the nutrition of the plants, animals, and ultimately, people, who are nourished by soils.

⁷³ Hatfield et al., "Ch. 6: Agriculture. Climate Change Impacts in the United States: The Third National Climate Assessment."



Benefits of Healthy Soils

- Improved water holding capacity
- Sequester carbon and reduce GHG emissions
- Functions as a biological system; habitat for important soil organisms
- Long-term sustainability of agriculture
- Enhance crop quality
- Improve resistance to weeds and pests

Source: COG

One example of resurging interest in soil health is the new Maryland Healthy Soils Program that provides farmers with a range of assistance to improve soil health. The program's purpose is to "promote healthy soil practices while meeting important goals set by the state's Climate Change Commission."⁷⁴ The bill received broad support from organizations like the Alice Ferguson Foundation, Chesapeake Bay Foundation, Maryland Farm Bureau, Maryland Department of Agriculture, and others concerned about farmers and the future of agriculture.⁷⁵

Public Understanding of Agriculture

There is some dissonance in the public's understanding of agriculture. Some communities want the benefits of agriculture (i.e. rural landscapes and experiences, local farm products, etc.) without the byproducts: noise, dust, odors, slow-moving traffic associated with farm equipment, or increased traffic from agritourism.

There are also some misperceptions about farm animal behavior and husbandry practices. The lack of public understanding has led to accusations of mistreatment, and the agricultural community has had to defend itself. To the Regional Ag Working Group's knowledge, these complaints do not refer to legitimate situations of animal abuse or substandard confinement.

Other Challenges to Agriculture

Some of the other issues that can pose impediments to the success of agriculture include water availability and cost, as well as competition from other industries for resource lands. For example, several jurisdictions in the region have developed, or considered, policies that would limit the use of prime agricultural soils for energy projects, instead encouraging them to use underutilized but developed properties.

⁷⁴ MDA, "Statement by Secretary Joe Bartenfelder on the Maryland Healthy Soils Act."

⁷⁵ Fair Farms, "Press Release."

OPPORTUNITIES TO SUPPORT AGRICULTURE

Despite the challenges facing many farmers and agricultural sectors, it is an exciting time to be in this evolving industry. The opportunities to support agriculture can be organized under five broad categories⁷⁶:

Education and Awareness: This includes (1) training and support for farmers, (2) agricultural curriculum for students, as well as (3) opportunities for residents, local leaders, and consumers to learn about the demands, realities, and benefits of running a successful farm-based business.

Business Development: This includes efforts to support the capability of individual agricultural enterprises to make strategic and operational changes. Business development includes counseling, concept development and market identification, land and capital access, financing, and marketing support.

Market Access: This covers access to local, regional, national, and global markets at both the wholesale and retail levels. In the Washington Ag Region, farmers, local agricultural marketing specialists, state departments of agriculture, buyers, value chain coordinators, and others assist farm and food businesses to identify markets for their products.

Policy: This includes policies and regulations related to everything from land use, environmental, and health-related requirements, agricultural land preservation programs, and policies to incentivize connections between farmers and consumers.

Economic Development, Information, and Strategic Planning: This category focuses on policy and infrastructure development to support sector growth rather than business development. This area is characterized by significant fiscal participation from government, nongovernmental organizations, and in some cases, private investors.

Education and Awareness

Education and technical assistance are critical for encouraging and supporting agricultural careers. Both are indispensable for developing an agricultural labor force and maintaining farmland through farm transition. Local governments should continue to support and promote agricultural fairs, 4-H programs, Future Farmers of America (FFA), and farm-to-school starting at an early age.



Farmers are aging nationally and within the region, but there is also increasing interest from new farmers. The Future Harvest CASA (Chesapeake Association of Sustainable Agriculture) Beginning Farmer Training Program enrolled 80 trainees in 2018. This is the largest class of trainees since the program started 9 years ago. (Future Harvest CASA)

⁷⁶ Based in large part on categories for local agricultural economic development investment created by ACDS, LLC in *Prince George's County Strategic Program for Agricultural Development*.

University extension services are also crucial for the agricultural community. Extension reaches everyone from farmers and home gardeners to low-income communities seeking nutrition education. Supporting funding of these services will be important. Lastly, expanding access to farmer development programs like beginner farmer training programs should be a priority.



Left: Veterans harvest squash as part of Arcadia's Veteran Farmer Training Program in Northern Virginia. (Arcadia Center for Sustainable Food and Agriculture) **Right:** Aspiring urban farmers participating in Eco City Farm's Growing Urban Farms and Farmers program in Prince George's County, MD. (Eco City Farms)

LEADERSHIP DEVELOPMENT

Strengthening opportunities for residents and local leaders to learn about the demands, realities, and benefits of running a successful farm-based business is critical, particularly at a time when fewer people are farming or have agricultural experience.

Maryland and Virginia currently offer leadership development programs for professionals in the agricultural industry. The LEAD Maryland and Virginia Agricultural Leaders Obtaining Results programs are unique opportunities to learn about agricultural and rural businesses while developing leadership skills. If local governments wish to grow their agricultural economy, staff and key partners are encouraged to learn more about these programs.

CIVIC ENGAGEMENT

There are numerous opportunities for farmers, rural business owners, community members, and advocates to volunteer their time to shape local food and agricultural policies and programs. These range from serving on Rural Economic Development Councils, Agricultural Resources Advisory Councils and Agricultural Land Preservation Boards, to joining the growing number of Food Policy Councils in the region.



A 2017 meeting and training for food policy councils in the Chesapeake Bay Region, Silver Spring, MD. (Lindsay Smith/COG)

Business Development

Business development needs for farmers vary based on what they grow or raise, who their customers are, business experience, access to capital, and more. Governments should offer a variety of business development services and support collaborative marketing efforts to help agricultural and food businesses remain competitive.

According to Ginger Myers, an agricultural marketing specialist at the University of Maryland Extension, three key business areas that farmers need support and training include:

- Logistics: e-commerce, delivery, aggregation
- Finance: forecasting, budgeting, and understanding margins
- Consumer Trends: understanding changes in tastes, preferences, and behavior

MARKETING SUPPORT

Marketing campaigns are considered a useful tool for promoting local agriculture and food in the region. The Virginia Grown product label and Maryland's Best program are two state marketing campaigns. Other organizations and counties have also created their own initiatives.

To provide more local examples, the Piedmont Environmental Council (PEC) launched Virginia's first *Buy Fresh Buy Local* campaign more than 10 years ago. Today there are nine Buy Fresh Buy Local chapters in the state and PEC is the regional coordinator for three chapters: Northern Piedmont, Charlottesville Area, and Loudoun County. In 2018, their printed guides featuring local food producers were mailed to more than 275,000 homes.



Loudoun County Farmer Trading Cards. (Lindsay Smith/COG)

In 2016, Loudoun County Economic Development and Loudoun County Public Schools partnered to create and distribute farmer trading cards to elementary school students. As of its third year, this popular program had distributed 269,000 cards featuring 27 local farmers as part of farm-to-school programming to connect students to agriculture. The program also inspired Montgomery County's Office of Agriculture to start its own program.

Collaborative branding is helpful but not enough. It requires market research to understand consumer preferences and identify opportunities that regional farmers can fulfill. It also means bringing together stakeholders who can strategically re-establish key components of the supply chain to improve regional access.

Market Access

The Washington Ag Region offers many opportunities for farmers to access millions of consumers. Continued collaboration and coordination is critical for improving access to direct-to-consumer, retail, and wholesale markets.

Retail and wholesale channels require special attention from players within the entire supply chain. The major obstacles for farmers in the region include a lack of aggregation points, processing facilities, and efficient distribution networks. Appropriate technology will also play an important role in enhancing market access.

Centralized and decentralized aggregation points can help with accessing wholesale markets or addressing last-mile delivery. Many also recognize the need for a variety of processing facilities to help strengthen the livestock, dairy, small grain, and craft beverage industries. Having shared access to value-added processing equipment could also facilitate access to wholesale buyers such as institutions.

Despite the challenges, the agriculture sector is evolving and can continue to contribute to economic growth. Economic impact studies point to agriculture's significant **multiplier effect**, which provides more reason to support rising opportunities in the local food economy to the benefit of farmers and the communities they serve.

FARM-TO-SCHOOL

Across the nation, more schools are serving locally grown food. In the 2013-2014 school year, 42 percent of districts surveyed said they participated in farm-to-school activities.⁷⁷ That's 5,254 school districts and 42,587 schools; purchasing nearly \$790 million in local food from farmers - more than double what was spent in the 2011-2012 school year.⁷⁸

Farm-to-school programs provide a range of health and educational benefits to students. It also stimulates the local economy. Based on the multiplier effect of 1.4 to 2.6, the \$790 million local food purchases can generate between \$1 to 2 billion in local economic activity.



Colleges and universities, as well as hospitals, can also be important community leaders in stimulating demand for local food. As an example, in 2012, University of Maryland (UMD) Dining Services committed to purchasing 20 percent sustainable foods by 2020.⁷⁹ The criteria included food that is local, fair,

⁷⁷ USDA FNS, "Overview."

⁷⁸ USDA FNS, "Farm to School Works to Stimulate Local Economies"; Simpson, "New USDA Census Results Show 23.5 Million Kids Participating in Farm to School."

⁷⁹ UMD Dining Services, "Sustainable Food Purchasing."

humane, and ecologically sound. Local was defined as food grown or processed within 250 miles of campus. In 2014, the campus achieved the 20 percent goal, and surpassed that with 26 percent sustainable food purchasing in 2016.

While demand for farm-to-school and other farm to institution opportunities is encouraging, meeting it is not straightforward. Much of the infrastructure and supply chain (aggregators, distributors, processors, and marketers) is not designed to serve regional market channels, and procurement requirements and constraints can make local purchasing challenging.

Policy

FEDERAL POLICY

Federal policies and regulations exert significant influence on agriculture. The food safety and immigration examples referenced earlier are just two examples. Since the Washington Ag Region is home to the federal government, collaborative relationships have developed between staff and researchers at the USDA, local farmers, and communities over time. Continuing to develop these should be a priority.

More needs to be done to put regional food and agriculture on a level playing field with other farms across the globe. The federal government can help improve domestic competitiveness through funding infrastructure, encouraging regional-scale supply chains, and establishing guidelines for better transparency and accountability regarding product labelling.

Aging infrastructure continues to be an obstacle for many agricultural communities. Federal programs such as the USDA Value Added Producer Grant and the USDA Rural Business Development Grant will be important for achieving this, as will local public and private investment.

The global and domestic food industry have undergone significant consolidation in the last 30 years. While economies of scale can reduce prices for consumers, it may also reduce choice, and make it difficult for producers operating at the regional-scale to compete. More policies or incentives to encourage regional-scale supply chains will be needed to help local growers compete in commodity markets heavily influenced by trade agreements, currency fluctuations, and global prices.

Lastly, policies or incentives that promote transparency and enforce accountability in product labelling will help consumers make more informed choices. Developing better label guidelines, advancing blockchain technology, and clarifying country or origin labelling (COOL) definitions can help.

LOCAL POLICY: REINTEGRATING AGRICULTURAL PRODUCTION INTO URBAN AND SUBURBAN COMMUNITIES

Although agriculture is often assumed to be a rural endeavor, agriculture is expanding into urban and suburban communities. While the growth of **urban agriculture** in the region is not quantified, it is attracting research and entrepreneurs. In turn, governments are starting to offer urban agriculture tax incentives to encourage it.

Today's urban farms exist indoors, on vacant lots, on rooftops, as part of walls, and other in non-traditional spaces. The region has seen growth in urban farms doing intensive outdoor field cultivation, utilizing season extending **hoop houses**, as well as operations engaged in **hydroponics**, **aquaponics**, **vertical farming**, and **controlled-environment agriculture** (CEA).

Local governments, institutions, some private landowners, and communities are also continuing to make land available for **community gardens** and **school gardens**. Some communities, including Arlington and Montgomery counties, as well as the District of Columbia, have long waiting lists for community garden spaces.



A few of the region's urban farm enterprises. **Top Left:** Up Top Acres farms on several roof tops in Washington, D.C. and Montgomery County, MD. (COG) **Top Right:** Three Part Harmony Farm grows food and flowers on several acres in Washington, D.C. (Tyler Grigsby) **Bottom Left:** Love & Carrots installation at The Pearl in Silver Spring, MD. (Natalie Carver/Love & Carrots) **Bottom Right:** Cultivate the City's H St. Farms: a retail rooftop garden center in Washington, D.C. (Niraj Ray/Cultivate the City)

Urban agriculture is evolving, but it cannot be relied upon to meet all food needs of the future for a variety of reasons. Urban agriculture primarily deals with high-value vegetables, herbs, and flowers – not fruit and nut trees, grains, and livestock.

Nonetheless, it is an important strategy for building resilience in the food system. Permitting and supporting agriculture in mixed used environments can spur innovation and connect communities and farmers throughout the region.

AGRICULTURE AND THE BUILT ENVIRONMENT

Food and agriculture are being included in new urban and suburban development projects in interesting ways in metropolitan Washington as residential amenities.

One example is the Tower Companies, which develops, owns and manages commercial, retail, and multi-family residential properties in the region. In recent years, the company has worked to integrate local agriculture into clients' properties. This includes marketing a local food delivery services' box shares in the office buildings it manages. In addition, the company has a community garden at its Bloom property, and an urban farm at The Pearl.

The 5,000 square feet urban farm at The Pearl is maintained by Love & Carrots, a small company that installs urban vegetable gardens. At this Silver Spring, MD, apartment community, residents can sign up for a share of fresh food grown on-site.⁸⁰



Left: The Ten Clarendon Rooftop Farm in Arlington, Virginia is another example of a new development offering tenants access to a food and recreational amenity. (Natalie Carver/Love & Carrots) **Right:** Photo at the Willowsford Farm, Loudoun County, Virginia (Willowsford Farm)

Food is also finding its way into new developments through **agrihoods**. Here, suburban communities are built around farms, rather than tennis courts and pools. Willowsford in Loudoun County was developed to preserve land and integrate agriculture with single family homes. Residents can learn about agriculture and food preparation, participate in cultivation, and purchase what's grown there at an on-site store.

Forest gardening, and **edible landscaping** are other methods being used to incorporate agriculture into different communities. Both offer opportunities to further embed food production into residential and commercial properties. Forested is an organization with a property in Bowie, MD that conducts research, designs forest gardens for others, and teaches interested community members about forest gardening.

⁸⁰ Gregorio, Interview with The Tower Companies.

Economic Development and Strategic Planning

There is a myriad of actions that local governments in the Washington Ag Region can take to augment existing support to farmers. Two important actions include creating investment funds to stimulate agricultural preservation and economic development, and facilitating in-depth strategic planning.

INVESTMENTS IN AGRICULTURE

Local, state, federal, and private investment in agriculture is critical. A great example is Fairfax County. In 2017, the county set aside \$500,000 to be used as matching funds for awards from the Governor's Agriculture and Forestry Industries Development Fund (AFID). This program provides economic development incentive grants for ag-related facilities, as well as planning grants to encourage localities to think strategically about how they can better support and integrate agriculture and forestry-based industries into economic development and job-creation efforts.⁸¹

With this investment, Fairfax County can support new agritourism ventures, lure a controlled environment agriculture business, or bring in any one of the growing number of agricultural technology companies into the county. Ultimately, organizations and businesses in Fairfax County can access more funding for strategic planning, feasibility studies, business development, capital investments, and initiatives that support agricultural and forestry industries.

STRATEGIC PLANNING

A top recommendation in the 2012 *What Our Region Grow* report was for the region's political leaders and decision makers to formulate a strategic plan and identify priority steps to sustain agriculture and capitalize on new opportunities. Currently, food and agricultural needs and opportunities are underrepresented in the region's efforts to plan for a more livable, prosperous, accessible, and sustainable metropolitan Washington.

Recently, COG was given an opportunity with the support of the USDA and local philanthropies to start a Regional Food Systems Program. This program, if institutionalized, would provide a unique opportunity to support the development and implementation of a strategic plan for agriculture.

This program would also create a regional food and agriculture commission or committee to oversee the successful implementation of a strategic plan, while providing a forum for COG members and public and private stakeholders to share best practices and solutions to near and long-term food and agriculture concerns.

Councils of government across the country are becoming more engaged in food and agriculture. The Sacramento Area Council of Governments (SACOG) is doing the most advanced regional, strategic planning for agriculture in the country. Located in one of the most agriculturally productive regions of the country, SACOG's Rural-Urban Connections Program is working to put food and agriculture on an equal footing with other land uses by using new data to analyze future opportunities.

Planning efforts in metropolitan Washington should follow SACOG's lead. Even though the regions differ significantly in the share of agricultural and resource lands, the continued loss of land in farms highlights the need for a greater level of urgency to strategically plan for agriculture in and around the region. Without a regional strategy to preserve the existing food and agricultural economy, the region risks eroding key assets, resources, and brands.

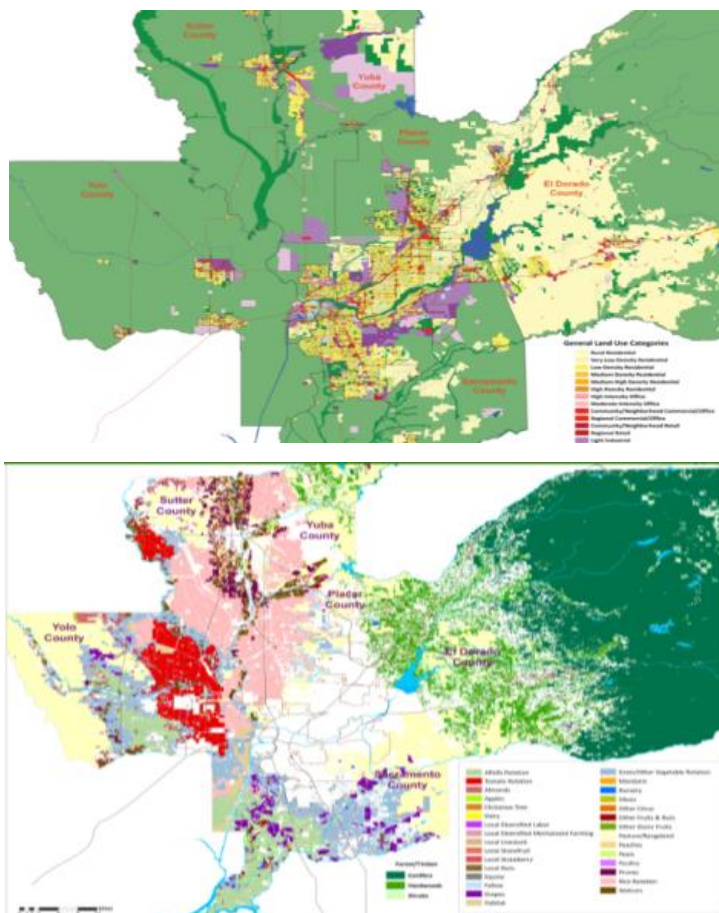
⁸¹ VDACS, "AFID Planning Grants."

Today, many are drawn to the region for its standard of living, vibrant food options, and access to rural landscapes. A healthy agricultural economy contributes to these qualities. Thus, strategic planning that protects and enhances agricultural interests should be an integral part of regional planning.

PLANNING FOR AGRICULTURE REQUIRES A CLOSER LOOK

The first image below shows a land use map of the SACOG region that many will be familiar with. Here, rural land use is viewed only as the broad category of open space, agriculture, and forestry. Below this image is a map that changes when the mindset shifts to understanding that planning for vibrant rural communities requires the same kind of detailed information and nuance that is required in urban areas. This second image shows the different kinds of agricultural products raised around Sacramento.

SACOG has used this new, more detailed information about what is being grown and raised in the region for planning and helping farmers and policymakers think about the future of the sector. The organization has used this data to develop scenarios for return on investment (ROI) analysis for alternative production opportunities. In addition, SACOG has been able to calculate how different production choices would result in differential labor costs, water usage, and climate impacts associated with different types of production. The power of this analysis resides in the potential to share it with farmers to understand how it could benefit their businesses; using the analysis and feedback to develop broader regional strategies for market development and the policy change.



Above: A general land use map for Sacramento and surrounding counties where rural lands are treated as one land use. **Below:** A detailed land cover and crop map of rural, agricultural production areas used in SACOG's scenario planning. (SACOG)

WHAT COULD OUR REGION GROW? A FEW EMERGING OPPORTUNITIES

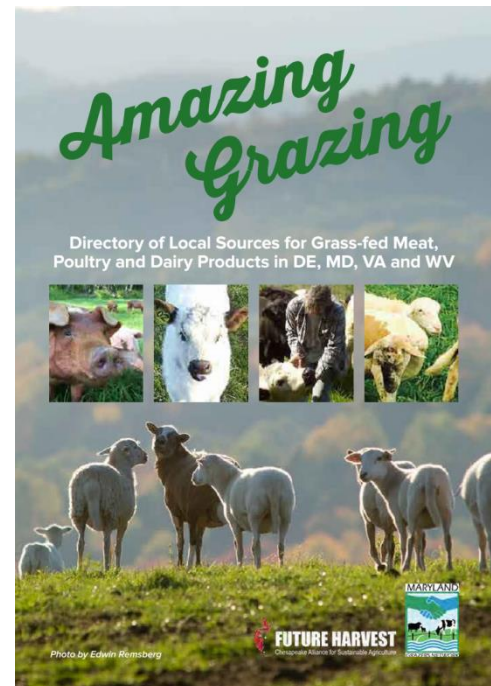
The following section details a few emerging trends and opportunities that the Regional Ag Work Group is tracking, demonstrating a few of the ways that agricultural opportunities are evolving. None of this information should be construed as business advice to farmers or investors.

Grazing and Pasture Raised Livestock

Pasture or grazing systems are growing in popularity. This approach has attracted appeal due to its animal welfare, environmental, and health benefits. It can also be a profitable alternative for farmers struggling against development pressures on land values and environmental constraints. For instance, research at the University of Maryland and Maryland Cooperative Extension seems to indicate that intensive grazing may help small dairies stay in business.⁸²

In 2005, Future Harvest CASA printed its first *Amazing Grazing* directory of producers raising livestock on pasture. In the most recent version of the directory, the number of listings has almost tripled to 195 operations throughout the Chesapeake Bay region. Poultry and dairy operations are also included. This increase is significant but also presents challenges for producers as competition has grown without a commensurate increase in consumer demand or slaughterhouse capacity.

Future Harvest CASA believes there are ways to grow consumer demand for local, grass-fed meat through channels like farmers markets and CSAs. However, these meat and dairy producers must contend with a unique set of marketing challenges. The organization hopes to provide consumer education on buying and preparing grass-fed meats since grass-fed meats have different cooking requirements than their grain-fed counterparts. The organization also plans to support grazers in keeping up-to-date on the latest marketing strategies and tools.



Organic Poultry and Grains

Today, consumers are more aware of growing practices and how it impacts their health and the environment. Many are demanding products that are organic, antibiotic-free, or humane. This is driving change among industry giants. In 2011, Perdue began selling certified organic products.⁸³ By 2017, its operations were 98-100 percent antibiotic-free.⁸⁴

⁸² University of Maryland Extension, "Grazing vs. Confinement."

⁸³ Pipkin, "Is Organic Farming Good for the Chesapeake?"

⁸⁴ Gross, "'Big Chicken' Connects Poultry Farming To Antibiotic-Resistant Bacteria."

With this shift, Perdue is purchasing more organic grains. This is a market opportunity for grain farmers to transition. As Perdue and other integrators respond to consumer demand, it can lead to changes in other production practices.

Growth of Ancient, Heritage, and Local Grains

Markets for ancient, heritage, and local grains are growing across the country. In 2015, Packaged Facts reported that 19 percent (1 in 5) Americans purchased menu or grocery items with ancient grains in the last 30 days.⁸⁵ This niche is popping up in Northeastern states, Wisconsin, Minnesota, Texas, and California.

Research being conducted by Cornell is in response to this demand.⁸⁶ Ancient grains are being marketed in Wisconsin in a variety of ways - the state even has brewers making gluten-free beer.⁸⁷ In Texas, Chip McElroy at Live Oak Brewing Company uses heritage wheat and other grains in his brewing process.⁸⁸ In California, the trend is making its way to farmers markets and the dining scene.⁸⁹

Further, well-known companies in the food industry are introducing these grain varieties in new products. Companies like The Kellogg Co. and Pepsi Co. are working to incorporate grains such as quinoa and amaranth into yogurt, bars, shakes, and pizza crusts.⁹⁰

Local Highlight: Seylou Bakery

Seylou Mill and Bakery is a new business that catalyzes the imagination about the potential to develop new agricultural supply chains. Opened in 2017 by Jonathan Bethony and Jessica Azeez, the couple and their team work with regional farmers as much as possible to source a variety of grains—not just wheat—for its artisan, whole grain breads and pastries. Some of the grains include wheat, sorghum, millet, rye, buckwheat, einkorn (an ancient wheat), and oats.

In the Northeast, there is an emerging network of farmers, nonprofits, university researchers, professional and home bakers, along with brewers and distillers, who are working together to adapt a variety of grains to growing conditions in this part of the country, and to develop new products.

Efforts such as these can open new market opportunities for local farmers. The popularity of locally grown and milled grains will ultimately determine how broad an opportunity this may be. For the Washington Ag



Several members of COG's Regional Ag Work Group visit Seylou Bakery & Mill in Washington, D.C.. (Lindsay Smith/COG)

⁸⁵ Menayang, "How Consumer Demand Is Resurrecting Ancient Grains from the Past."

⁸⁶ Ramanujan, "Heritage and Ancient Grain Project Feeds a Growing Demand."

⁸⁷ Muckian, "Bringing Ancient Grains to Market in Wisconsin."

⁸⁸ McKissack, "Heritage Grains."

⁸⁹ Karp, "Kenter Canyon Farms Reaps Harvest of Locally Grown Wheat"; Lowe, "Heritage Grains Are Infiltrating L.A.'s Dining Scene - and Maybe Your Kitchen."

⁹⁰ Gelski, "Ancient Grains Rising in Product Development."

Region, this is a very nascent supply chain, however, given the amount of grain that is grown in the region it is difficult not to feel optimistic that some number of interested farmers might find a new opportunity in growing new grains.

Micro-dairies - A Search for Authenticity

Despite a decline in small-scale dairies, a growing trend may help slow this. Micro-dairies create small-batch volumes, often priced for a high-end market. The selling point for these dairies is a hyper-local product that offers transparency and authenticity.

Changing Consumer Preferences

1. There is increased demand for grass-fed products. For example, sales of grass-fed yogurt and kefir have increased by over 38 percent in 2017.⁹¹
2. Fluid milk consumption has decreased over the last few decades. Reduced consumption of ready-to-eat cereals is driving down demand.
3. Consumers are increasingly turning to plant-based alternatives such as almond- and coconut-based beverages.
4. Shifting consumer preferences to full-fat dairy products such as butter, cheese, and yogurt.⁹²
5. Sales of full-fat flavored and whole milk are up 1.1 billion pounds from 2012 to 2016.⁹³
6. Reduced-fat flavored milk sales is also growing. School lunch guidelines are driving some of this consumption.

The current dairy industry struggles with adapting marketing around consumer trends and global commodity prices that can hurt profit margins. Many consumers today demand transparency and authenticity in the food they purchase. This means knowing the farmer and understanding the farming practices used.

Addressing the demand for local, grass-fed, organic, small-batch, or full-fat dairy products can help improve profitability through higher prices. There are also specialized markets for dairy products where developing new offerings for niche markets may provide additional opportunity. A forthcoming regional supply chain study is expected to provide some assessment of this.

Industrial Hemp

The 2018 Farm Bill provides some potentially good news for farmers in the region. The legislation allows hemp to be legalized and regulated by the USDA. That means hemp will be de-listed under the Controlled Substances Act and can be sold through interstate commerce as a non-drug commodity. This change will help farmers diversify operations and spur research and investment to re-establish the supply chain for hemp products.

Hemp is also ideal for the region. It is versatile and can be easily grown, especially in Virginia where it was first introduced during colonization. The crop itself has several advantages. It requires low inputs, has high yields per acre, is resistant to most pests, and grows in various climates and soil types. Its high yields also allow it to be a good replacement for tobacco farms in the region. Several research trials are already underway in Virginia, and some Maryland researchers and growers are also studying the opportunity.

⁹¹ Matsumoto, "Why More Farmers Are Making The Switch To Grass-Fed Meat And Dairy."

⁹² VAFB, "Dairy Industry Has Seen Consumer Trends Drying."

⁹³ Newton, "Trends in Beverage Milk Consumption."

The market for hemp products is vast. It is estimated that there are over 25,000 uses for industrial hemp ranging from paper, fiber, plastics, biofuels, food, textiles, rope, pharmaceuticals, to industrial materials. In fact, the total retail value of hemp products sold in the US in 2016 was at least \$688 million.⁹⁴ As a result of the new Farm Bill, this market can be expected to grow rapidly in the next few years.

Cut Flowers

The Regional Ag Workgroup has noted cut flower businesses as an area of new growth in local agriculture. Most of these farms appear to be marketing through retail or direct-to consumer (e.g. flower CSAs). Some of the farms in the region offering flower CSAs include [Redtree Farmstead](#), [Big White Barn](#), and [Anchored Roots Farms](#). Farms such as [Hope Flower Farm](#), [EcoBlossoms Farm](#), and Firefly Flowers focus on weddings, bouquet subscriptions, or events. Opportunities also exist working with floral designers looking to support local growers. (i.e. [Beaumont House Design](#))



Left: Inside a high tunnel at Anchored Roots Farm in St Mary's County, MD. (Anchored Roots Farm)

Above: Local flowers at market from Red Tree Farmstead in Charles County, MD. (Red Tree Farmstead)

⁹⁴ Thayer, Harvest NY, and Burley, "Industrial Hemp from Seed to Market."

SUMMARY RECOMMENDATIONS

COG's Regional Ag Work Group recommends the following actions to preserve and strengthen agriculture in the region.

CREATE A REGIONAL COMMITTEE ON FOOD AND AGRICULTURE AT COG

Maintaining farmland, profitable farms, and connecting them to markets merits regional attention, particularly as the region's farmland continues to decline. A regional committee is needed where COG members can share information on state and local initiatives, examine best practices to address the unique challenges that agriculture faces, support new opportunities as they emerge, and elevate this essential sector in the same way the region focuses on other necessities like water.

In addition to the range of long-time food and farm technical assistance providers, state agencies, lenders, land grant universities, and many more working to strengthen the agricultural economy, new partners should be brought to this effort, like the Greater Washington Board of Trade, state and local tourism agencies, and investors and philanthropy.

CO-HOST REGIONAL FORUMS ON FARM VIABILITY, LAND PRESERVATION, AND NEXT GENERATION FARMERS IN THE WASHINGTON AG REGION

Local agriculture will not survive long-term unless it is profitable as a profession. Sufficient, accessible, high-quality land and soil must also be maintained or opportunities for current and future farm activities will diminish.

The region should leverage the expertise and work of state departments of agriculture, its land grant universities, Soil Conservation Districts, nonprofit organizations, land trusts, Maryland Agricultural and Resource-Based Industry Development Corporation, Farm Bureau, Future Harvest CASA, Virginia Association of Biological Farming, Mid-Atlantic Farm Credit and other lenders, COG's Regional Agricultural Work Group, and others, to co-host forums focusing on the unique opportunities and challenges of farming in metropolitan Washington. Initial forums should focus on ensuring that farming remains a viable profession now and in the future. Conversations on soil health, supporting a diverse farm workforce, and support services for a profitable farm economy also need a metropolitan audience.

COMMISSION AND IMPLEMENT A STRATEGIC PLAN FOR AGRICULTURE

The region's political leaders and decision-makers should formulate a cohesive strategic plan and identify priority steps to sustain agriculture and capitalize on new opportunities through the 21st century. Such a plan should consider best practices for supporting vibrant rural economies, land preservation, connecting urban and rural farmers to market opportunities, the emerging role that soil health can play in protecting farmers' investments and providing community benefits like climate change mitigation, and more. It should also establish baseline data and metrics for benchmarking progress towards goals. This is needed to complement and accelerate work happening at the local level by farmers and food entrepreneurs, researchers, investors and philanthropic funders, nonprofit organizations, and citizen advocates. This could be accomplished through leadership provided by COG working in partnership with local member and non-member jurisdictions.

FUND AGRICULTURAL-RELATED TECHNICAL, EDUCATIONAL, AND MARKETING SERVICES AT THE COUNTY-LEVEL

Ongoing funding for roles such as Agricultural Marketing Specialists, university extension services, and K-12 educational programs and opportunities will continue to be critical to supporting agriculture in the region moving forward and promoting public understanding of the demands and benefits of farming. Agricultural technology is evolving rapidly and support for technical assistance for farmers in evaluating new tools to strengthen their operations should be considered.

MAKE CONTINUED IMPROVEMENTS IN STATE AND LOCAL POLICIES AND REGULATIONS TO SUPPORT DIVERSIFICATION OF FARM ACTIVITY

Farmers need to be able to diversify their operations to remain competitive in a dynamic marketplace and region. For many farmers, but especially those with limited resources, keeping up with evolving regulations can be costly. Local regulations and policies like zoning and permitting also have a profound impact on farm businesses. Several jurisdictions are in the process of updating their comprehensive plans and zoning ordinances. Member jurisdictions are encouraged to streamline requirements whenever possible, and to prepare for a future where agriculture is embedded into architecture and city design, not rural communities alone. Keeping, or bringing, agriculture close to where residents live, and work is important for a variety of reasons.

INCENTIVIZE LOCAL FOOD AGGREGATION, PROCESSING, DISTRIBUTION, AND PURCHASING

Interest in local food is at an all-time high and the size of the local food market is growing. Meetings with COG's Local Food Distribution Work Group have demonstrated that there are many local farmers around the region interested in providing more food to the region. However, a lack of infrastructure, information, and appropriate market signals prevents farmers from growing, raising, and processing more product.

Local governments can help by assessing their public purchasing programs and how accessible they are to local producers. Changes to procurement policy and or incentives may be needed. Engaging with other local institutions such as colleges and universities, as well as hospitals, to encourage local purchasing would also be helpful. A regional forum on this issue could also be useful to advance this recommendation.

In some cases, growers are lacking the necessary infrastructure to work with institutional and wholesale buyers. The answer may not be for every jurisdiction to build its own aggregation, distribution, or processing infrastructure. Rather jurisdictions should collaborate and evaluate what is available jointly to meet regional demand and needs. There are several important studies underway in the region to assess regional food infrastructure and the supply chain. COG will make it a priority to share the results with a broad set of stakeholders as this information becomes available.

APPENDIX A

Washington Agricultural Region Production and Consumption Comparison, 2012

Please read the next page to understand the methodology used for these calculations.

Food Product	Production (ac./animals)	Demand (ac./animals)	% Fulfilled	Surplus/Deficit	Production (lbs)	Consumption (lbs)	% Fulfilled	Surplus/Deficit
Apples	1,778	18,655	10%	-16,877	26,579,469	283,517,541	9%	-256,938,072
Blueberries	56	3,101	2%	-3,045	257,236	11,537,474	2%	-11,280,238
Strawberries	34	12,896	0%	-12,862	199,886	63,574,231	0%	-63,374,346
Beans								
Lima Beans	0	1,226	0%	-1,226	0	2,658,266	0%	-2,658,266
Snap Beans	2,323	10,139	23%	-7,816	9,578,564	42,143,238	23%	-32,564,674
Potatoes	181	28,533	1%	-28,352	4,778,400	744,043,037	1%	-739,264,637
Pumpkins	588	3,167	19%	-2,579	5,911,091	32,655,334	18%	-26,744,243
Squash	91	3,404	3%	-3,313	809,638	30,103,385	3%	-29,293,747
Sweet Corn	1,346	24,106	6%	-22,760	9,596,857	157,616,736	6%	-148,019,879
Tomatoes	444	35,615	1%	-35,171	7,605,232	565,956,998	1%	-558,351,766
Wheat	63,079	238,021	27%	-174,942	231,769,194	870,744,135	27%	-638,974,941
Corn ⁹⁵	169,121	36,564	463%	132,557	1,068,705,029	219,793,196	486%	848,911,833
Soybean	163,409							
Beef	119,166	722,321	16%	-603,155	56,014,733	353,510,480	16%	-297,495,746
Chicken	65,357	74,169,582	0%	-74,104,225	317,756	362,685,323	0%	-362,367,566
Pork	36,966	1,905,264	2%	-1,868,298	5,301,757	275,921,613	2%	-270,619,856
Dairy	44,041	235,067	19%	-191,026	740,506,771	3,976,789,744	19%	-3,236,282,973

⁹⁵ The values for corn are based on the per capita consumption of corn for grain used for direct human consumption, not for animal feed. Products include corn flour, corn meal, hominy and grits, and corn starch.

Methodology

Production (acres/animals): Aggregation of harvest or inventory data for each county in 2012 from USDA NASS QuickStat.

Demand (acres/animals): The consumption (or demand) values are divided by the yield factors. This results in total acres or heads of animals that are needed. Calculation for DC uses the yield numbers from MD as a proxy for production needed.

Production (lbs): Calculated by multiplying the production values by the yield factors.

Consumption (lbs): Calculated by multiplying the population of each county that is 2 years and older by the per capita consumption of each food item. Population data is derived from single-age year estimates in 2012 from the US Census. Per capita consumption data is taken from the ERS Food Availability Database for 2012.

Population (ages 2 years and older)

1. County Level

- a. The consumption calculation uses the population of each county that is 2 years and older. Determining this requires the total population and single-age year estimates. While single-age year population data for each state is available through the US Census, it is unavailable on a county basis. The exception is DC, since DC planning provides single-year age estimates.

- b. The single-age year estimates for each county is calculated by:

$$\left(\frac{0 \text{ to } 4 \mid \text{County}}{0 \text{ to } 4 \mid \text{State}} \right) \times (\text{Single-age year} \mid \text{State})$$

- c. $(0 \text{ to } 4 \mid \text{County})$ is the age group population data for ages 0 to 4. This data comes from the US Census for each county.
- d. $(0 \text{ to } 4 \mid \text{State})$ is the age group population data for ages 0 to 4, which is available through the US Census for each state.
- e. $[(0 \text{ to } 4 \mid \text{County}) / (0 \text{ to } 4 \mid \text{State})]$ represents the ratio of a county's 0 to 4 population to that of the state's. Multiplying this ratio by $(\text{Single-age year} \mid \text{State})$ assumes that the single-age year population for each county is proportional to the county's share of the state's 0 to 4 population.
- f. $(\text{Single-age year} \mid \text{State})$ is the single-age year data for each state. Maryland data comes from Maryland Department of State; Virginia data comes from Kids Count; West Virginia data comes from the US Census; and DC data comes from DC Planning.

Yield Factors:

All yield numbers are 10-year averages based on available data from 2001 to 2010, and have been converted to lb/acre or lb/head equivalents. For livestock yields, pork and beef yields are adjusted to reflect demand for boneless/trimmed cuts. Pork yields about 57% of the live weight, and beef yields about 42.7% of the live weight.

All crop yield numbers for Maryland, Delaware, Pennsylvania, West Virginia, New Jersey, and New York are provided by Timothy Griffin and Zach Conrad, as summarized in Griffin, T., Conrad, Z., Peters, C., Ridberg, R., and Parry Tyler, E. 2014. Regional self-reliance of the Northeast food system. Renewable Agriculture and Food Systems 1-15.

Virginia crop yield numbers are 10-year averages (2001-2010) of data available from USDA NASS Quickstat. However, Virginia yield numbers for strawberries, blueberries, and squash are partially or completely based on North Carolina yield numbers. We consider North Carolina yield values to be a good proxy based on close geography and similar climate zones.

All chicken and dairy yield numbers are from USDA NASS Quickstat. Beef and hog numbers are average live weights at slaughter. Data is from USDA NASS Quickstat and the Livestock Slaughter Annual Summary.

APPENDIX B

Data Sources and Limitations

Data Sources

1. The report primarily relies on the USDA NASS Census of Agriculture data.
2. Per capita consumption data is taken from the ERS Food Availability Database for 2012.
3. Population data primarily comes from the US Census.
4. Yield data for crops from 2001 to 2012 used in the production needed calculations were compiled by Tim Griffins at Tufts University.

Data Limitations

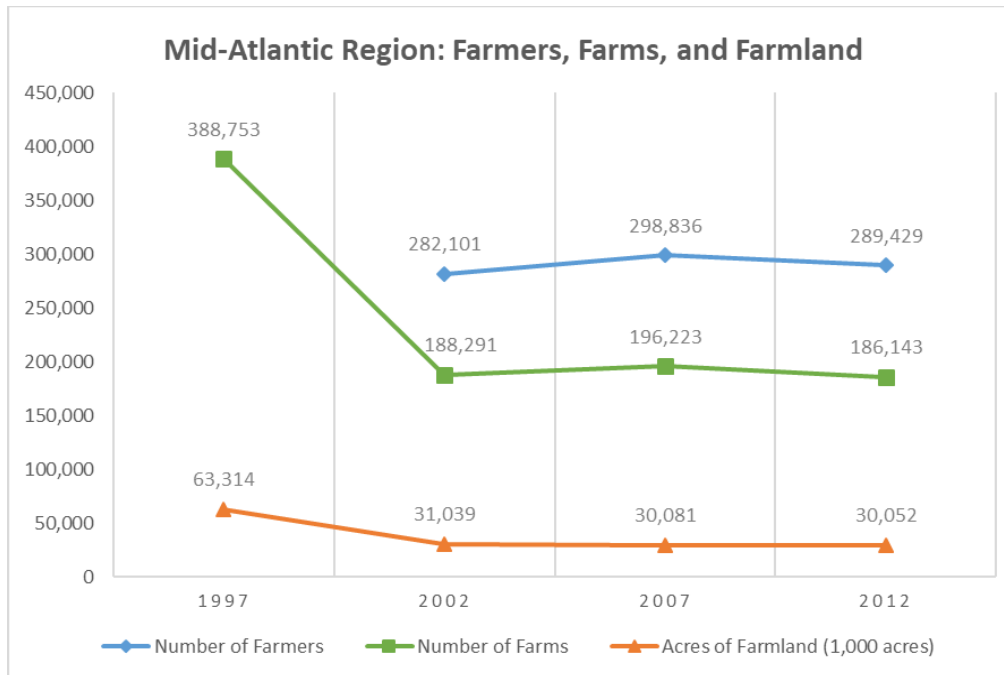
1. Data Lag: This report uses 2012 Census of Agriculture data. 2017 Census of Agriculture data would be preferred, but is unavailable until February 2019, at the earliest.
2. Changes in Census of Agriculture methodology since 1997: Makes comparisons with 2002, 2007, or 2012 challenging especially with regards to demographic data.
3. Changes in the definition of farms in 1975: This affects the interpretation of trends in number of farms. The Census of Agriculture also does not include urban farms. Although small in number, these farms are increasing in Washington, DC and other urban areas in the COG Region.
4. Farmer Operators: Data on all operators is only available in the 2007 and 2012 Census of Agriculture. However not all demographic data is available for all operators.
5. Inconsistency with local data: There may be inconsistencies between USDA data and local jurisdiction data due to Census of Agriculture responses rates and differences in definitions of data collected. Data and charts presented here are mainly to show overarching trends that are significant.
6. Census of Agriculture data provides data in aggregate or averages: The analysis of the data does not reveal granular details of all forms of farm operations. For example, yield values used in production and consumption calculations may vary significantly for an open field operation versus a CEA operation. However, USDA NASS aggregates and averages the yield values across all operations for each commodity.

APPENDIX C

Mid Atlantic Data

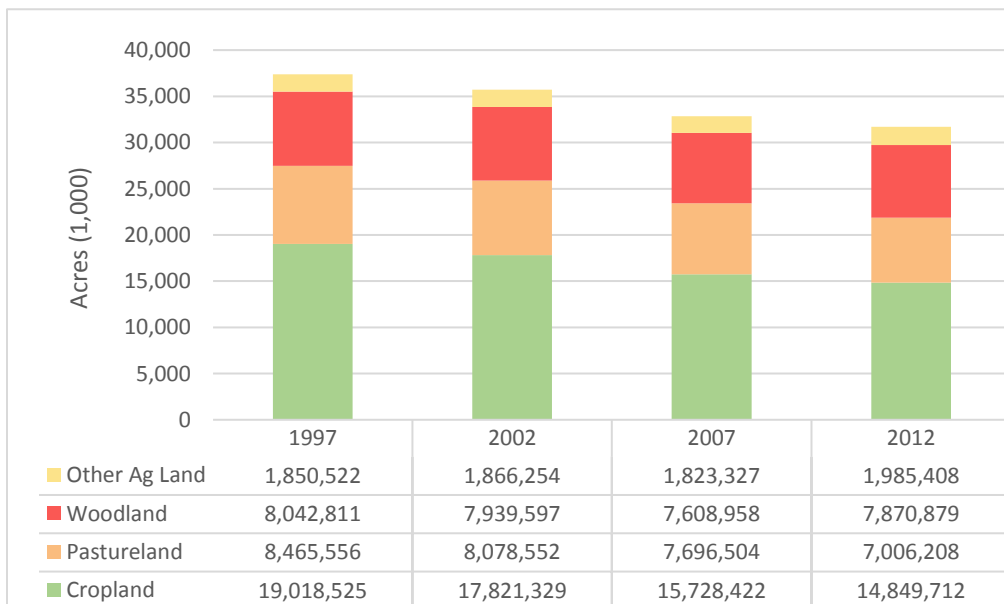
States included in the Mid-Atlantic Region are Chesapeake Bay Watershed states: Delaware, Maryland, New Jersey, New York, Pennsylvania, Virginia, and West Virginia

Figure 25. Farmers, Farms, and Farmland in the Mid-Atlantic Region



Source: USDA NASS Census of Agriculture

Figure 26. Composition of Agricultural Lands in Mid-Atlantic Region



Source: USDA NASS Census of Agriculture

Mid-Atlantic Region Production and Consumption Comparison, 2012

Food Product	Production (ac./animals)	Demand (ac./animals)	% Fulfilled	Surplus/Deficit	Production (lbs)	Consumption (lbs)	% Fulfilled	Surplus/Deficit
Apples	77,930	123,178	63%	-45,248	1,726,988,850	2,504,447,408	69%	-777,458,558
Blueberries	11,477	27,333	42%	-15,856	69,360,301	101,916,081	68%	-32,555,779
Strawberries	2,694	121,695	2%	-119,001	14,100,739	561,581,898	3%	-547,481,159
Beans	68,377	95,668	71%	-27,291	274,953,219	395,753,327	69%	-120,800,108
Lima Beans	17,424	9,720	179%	7,704	36,250,200	23,481,746	154%	12,768,454
Snap Beans	50,953	85,949	59%	-34,996	238,703,019	372,271,582	64%	-133,568,562
Potatoes	42,338	251,147	17%	-208,809	1,133,462,400	6,572,491,589	17%	-5,439,029,189
Pumpkins	18,798	23,534	80%	-4,736	271,671,279	288,460,342	94%	-16,789,063
Squash	10,001	22,062	45%	-12,061	149,678,445	265,917,739	56%	-116,239,295
Sweet Corn	69,827	168,894	41%	-99,067	560,399,915	1,392,304,776	40%	-831,904,860
Tomatoes	13,918	290,696	5%	-276,778	296,333,456	4,999,371,575	6%	-4,703,038,119
Wheat	793,529	2,295,482	35%	-1,501,953	2,803,931,471	7,691,703,599	36%	-4,887,772,128
Corn	2,747,728	322,063	853%	2,425,665	17,172,427,304	1,941,539,479	884%	15,230,887,826
Soybean	2,166,219							
Beef	2,706,370	6,451,702	42%	-3,745,332	1,275,681,686	3,122,728,845	41%	-1,847,047,159
Chicken	1,016,516,580	640,495,616	159%	376,020,964	5,339,024,191	3,203,774,667	167%	2,135,249,524
Pork	5,655,094	22,531,731	25%	-16,876,637	800,360,561	2,437,348,903	33%	-1,636,988,341
Dairy	1,309,874	1,967,082	67%	-657,208	24,363,007,282	35,128,904,977	69%	-10,765,897,695

APPENDIX D

Fruit and Vegetable Production in Maryland and Virginia

The following tables show fruit and vegetable farm and sales trends in Maryland and Virginia. [Table 9](#) shows that fruit farms and sales are growing in both states. On the other hand, vegetable farms are declining in Maryland and increasing in Virginia. However, vegetable sales are increasing in both states. This also means that Maryland vegetable farms in 2012 were generating greater sales per farm compared to those in 1997.

The size of fruit and vegetable farms in both states also reveals a shift towards small-scale farms. [Table 10](#) shows a significant increase among produce farms that are between 1 to 70 acres, Similarly, the sales data by farm size in [Table 11](#) shows that small-scale produce farms are rapidly growing in sales volume.

Table 9. Fruit/Vegetable Farms and Sales by State

Year	State	Fruit Farms and Sales		Vegetable Farms and Sales	
		Number of Farms	Sales (\$1,000)	Number of Farms	Sales (\$1,000)
2012	MD	476	20,065	797	70,711
2007	MD	608	19,393	940	56,394
2002	MD	468	12,967	843	60,488
1997	MD	395	12,153	950	41,679
2012	VA	1,354	65,820	1,665	92,323
2007	VA	1,358	68,193	1,619	93,988
2002	VA	1,251	40,954	1,303	79,345
1997	VA	751	34,606	1,008	45,704

Source: USDA NASS Census of Agriculture

Table 10. MD and VA Fruit Farms by Acreage

	Fruit Farms			Vegetable Farms		
	1997	2012	% Change	1997	2012	% Change
1 to 9 acres	155	308	99%	209	422	102%
10 to 49 acres	374	720	93%	592	858	45%
50 to 69 acres	103	179	74%	161	189	17%
70 to 99 acres	93	166	78%	152	209	38%
100 to 139 acres	83	123	48%	151	159	5%
140 to 179 acres	62	72	16%	102	105	3%
180 to 219 acres	40	33	-18%	65	76	17%
220 to 259 acres	33	42	27%	62	42	-32%
260 to 499 acres	101	103	2%	200	172	-14%
500 to 999 acres	67	41	-39%	158	104	-34%
1,000 to 1,999 acres	21	33	57%	73	78	7%
2,000 or more acres	14	10	-29%	33	48	45%
Total	1,146	1,830	60%	1,958	2,462	26%

Source: USDA NASS Census of Agriculture

Table 11. Maryland and Virginia Produce Sales by Acreage

	Fruit Sales (\$1,000)			Vegetable Sales (\$1,000)		
	1997	2012	% Change	1997	2012	% Change
1 to 9 acres	366	1,273	248%	1,012	3,601	256%
10 to 49 acres	2,761	8,289	200%	5,989	12,619	111%
50 to 69 acres	1,457	3,059	110%	2,705	8,906	229%
70 to 99 acres	990	4,016	306%	2,620	4,906	87%
100 to 139 acres	2,308	3,424	48%	4,986	4,827	-3%
180 to 219 acres	1,495	2,022	35%	2,052	4,775	133%
260 to 499 acres	6,987	17,636	152%	2,657	3,315	25%
140 to 179 acres	2,550	3,780	48%	5,956	3,315	-44%
220 to 259 acres	2,920	1,915	-34%	13,241	21,423	62%
500 to 999 acres	8,818	11,246	28%	13,661	22,485	65%
1,000 to 1,999 acres	6,982	10,714	53%	15,433	43,163	180%
2,000 or more acres	5,405	14,951	177%	17,069	29,700	74%
Total	46,759	85,885	84%	87,383	163,034	87%

Source: USDA NASS Census of Agriculture

APPENDIX E

Preserved and Public Lands in the Washington Ag Region: 2017 Estimates

Jurisdiction	Land Area	Private Easement	Public Lands	Total Acres	Percent Protected	State Incentive and or Easement Program	Donated Easements, Land Trust Management	TDR	PDR
MARYLAND									
Anne Arundel	265,536	60,543	25,400	85,943	32%	Y	Y		Y
Calvert	136,416	28,910	2,283	31,193	23%	Y	Y	Y	Y
Carroll	286,464	76,286	8,005	84,291	29%	Y	Y		Y
Saint Mary's	228,595	22,318	13,265	35,583	16%	Y	Y	Y	Y
Washington	292,979	28,000	32,365	60,365	21%	Y	Y		Y
Howard	160,474	22,798	32,198	54,996	34%				
Charles	292,960	23,048	72,104	95,152	32%	Y	Y		Y
Frederick	426,880	57,152	57,471	114,623	27%	Y	Y		Y
Montgomery	324,480	70,564	5,300	75,864	23%	Y	Y	Y	Y
Prince George's	319,360	6,165	22,000	28,000	9%	Y	Y		Y
Washington, D.C.	43,738		7,891	7,891	18%	Y			
VIRGINIA									
Arlington	16,640		1,784	1,784	11%				
Fairfax	259,840		23,418	23,418	9%				
Loudoun	333,579	57,549	11,010	68,559	20.60%	Y	Y		
Prince William	222,720	3,194	22,556	25,750	12%		Y		
Clarke	114,023	25,247	4,293	29,540	25.90%	Y	Y		Y
Culpeper	244,707	18,917	1,508	20,425	8.30%				
Fauquier	417,101	104,893	18,095	122,988	29.50%	Y	Y		Y
King George	120,320								
Rappahannock	171,022	32,744	31,263	64,007	37.40%				
Stafford	179,200	4,558	5,707	10,265	6%				Y
WEST VIRGINIA									
Jefferson	135,680	4,023		4,023	3%				Y
Total COG Region	2,240,197	217,507	223,534	441,041	20%				
Total Washington Agricultural Region	4,992,714	646,744	397,916	1,044,660	21%				

Data for Clarke, Culpeper, Fauquier, Loudoun, and Rappahannock Counties provided by Piedmont Environmental Council.

APPENDIX F

The Poultry Industry

Becoming a Poultry Producer

There are two types of poultry producers: contract growers and independent growers. Contract growers are poultry growers that sign contracts with companies called integrators (e.g. Perdue, Tysons, Pilgrim's Pride, George's); virtually all the Delmarva poultry farms are contracted. On the other hand, independent growers are not held to contracts. Each pathway shapes a farm's operating characteristics, production practices, regulatory restrictions, and profitability.

Contract growers are part of a vertically integrated supply chain. The integrator controls the animal genetics, feed, veterinary services, production standards (i.e. conventional, antibiotic free, organic), slaughtering, and processing. While it supervises broiler growth, the contract growers are responsible for the land, broiler house, labor, and normal operating expenses. Since integrators sell across state lines, they implement practices in line with federal regulations. Ultimately, the contract grower's profits are determined by the contract which may be based on performance or a service fee.

Independent growers have total control over all facets of their farm operation. The size of the operation and its distribution channels determines the food safety, facility, slaughter, and processing regulations that apply, and independent growers bear all their costs and expenses. They can experiment with different breeds and production practices (i.e. conventional, pasture-raised, antibiotic free, organic, soy free, or some combination). Profits are determined by the grower's market channels, market access, processing infrastructure and transportation needs, and production output and sales.

Industry Concerns

Grower Risks: All operations face risks. The biggest risks for contract growers are financial and placement risks. Most contract growers are compensated on a performance basis and is determined by relative performance to other growers. This means payments can vary depending on how many exceptional growers one is competing against any given week. Further, contract growers face placement risks. Half of integrator contracts are flock-to-flock, which means the integrator does not guarantee to place flocks on an operation beyond the current one.⁹⁶ This was not an issue when production was growing rapidly, but the current flat trend in production can lead to contract nonrenewal or having fewer chicks placed.

Manure: Problems surrounding poultry manure is probably the largest environmental and public health issue. Poultry manure is high in phosphorus and leads to eutrophication of waterways when mismanaged. The high-density growing environments also causes high concentrations of nutrients in local areas. Further, confined animal feeding operations can generate significant dust, odors, and truck traffic that negatively affects surrounding neighbors, especially those at risk for asthma.⁹⁷

Economic: There is a lack of regional information about market barriers and opportunities for independent growers much of it is anecdotal.

⁹⁶ MacDonald, "Financial Risks and Incomes in Contract Broiler Production."

⁹⁷ Baltimore Sun, "Too Much Manure, Too Little Oversight."

APPENDIX G

Dairy Farming Supply Chain

The dairy supply chain depends on an efficient cold-chain, processors, and a dependable market. Due to its highly perishable nature, liquid milk is often sold within a 100-mile radius of the source (the milkshed). That is why value-added processing creates products with longer shelf life and can be sold farther.

Dairy farms have several options to get their milk to market. They can join cooperatives, contract with processors, or sell direct-to-consumer. Some farms engage in on-farm value-added processing to make cheese and ice cream. The Washington Agricultural Region is home to several of these: South Mountain Creamery, Prigel Farm Creamery, Georges Mill Farm Artisan Cheese.

Many dairy farms are part of cooperatives. Dairy cooperatives are farmer-owned and ensure that members benefit from its services. The cooperative engages in a variety of activities, which includes negotiating prices, assembling, hauling, manufacturing, processing, or marketing. The key is that members get a proportional share in the cooperative's profits based on the volume of milk they market through the cooperative. There are two primary cooperatives in the region: Maryland & Virginia Milk Producers Cooperative Association, and Dairy Farmers of America Inc.

Still, many farms sell to dairy processors. Major processors with plants in the region include Nestle, Galliker Dairy Co., and Cloverland Farms Dairy.

GLOSSARY OF TERMS

Agribusiness: Farming engaged in as a large-scale business operation embracing the production, processing, and distribution of agricultural products; and the manufacture of farm machinery, equipment, and supplies.

Agritourism Income: This income includes income from recreational services such as hunting, fishing, farm or wine tours, hay rides, etc.

Aquaculture: The farming of fish, crustaceans, mollusks, and other aquaculture products.

Aquaponics: an aquaculture system in which the waste produced by farmed fish or other aquatic animals supplies nutrients for plants grown hydroponically, which in turn purify the water.

Beginning Farmer or Rancher: An individual that (1) has not operated a farm or ranch, or who has operated a farm or ranch for 10 years or less, and (2) will materially and substantially participate in the operation of the farm or ranch.

Broiler: a young meat chicken that is typically around 60 days old and whose meat is tender and juicy, with a small amount of fat.

COG: the regional planning organization for the Washington, DC area, which is comprised of elected officials from 22 local governments, members of the Maryland and Virginia state legislatures, and members of the U.S. Congress.

COG Board: The COG Board of Directors is comprised of members from the following jurisdictions and municipalities – **Maryland:** Bladensburg, Bowie, Charles County, College Park, Frederick, Frederick County, Gaithersburg, Greenbelt, Montgomery County, Prince George’s County, Rockville, and Takoma Park; **Virginia:** Alexandria, Arlington County, Fairfax, Fairfax County, Falls Church, Loudoun County, Manassas, Manassas Park, and Prince William County; **District of Columbia.**

COG Region: The approximately 3,600 square mile area served by the Metropolitan Washington Council of Governments.

Community Garden: Private or public land where a group of people garden on individual or shared plots.

Community Supported Agriculture (CSA): A network of individuals who, as paying subscribers, have pledged to support a local farm. Members typically pay at the beginning of the growing season and receive weekly shares of vegetables and fruits, as well as possibly herbs, cut flowers, eggs. Dairy products and meat. Some CSA’s waive membership fees for contributed labor.

Controlled-environment Agriculture (CEA): A technology-based approach to food production that aims to provide the optimal growing conditions. Production occurs in an enclosed structure such as a greenhouse or building.

Custom Slaughterhouses: Slaughterhouse that offer slaughtering services without federal inspection and oversight. The meat and byproducts from animal can only be consumed by the owner and his or her household, and cannot be sold.

Cornmeal: A meal (coarse flour) ground from dried maize or corn. Very finely ground cornmeal is commonly referred to as corn flour.

Direct Farm Sales: includes both fresh foods and processed or value-added products such as bottled milk, cheese, meat, jam, cider, wine, etc.

Direct to Consumer Sales: value of agricultural sales sold directly for human consumption from roadside stands, farmers' markets, pick-your-own sites, etc. It excludes non-edible products such as nursery crops, cut flowers, and wool but includes livestock sales.

Eastern Shore: The region of Maryland and Virginia east of the Chesapeake Bay.

Food Security: Is a condition by which households do not have food-access problems but have the means to obtain enough to fulfill their nutritional needs

Edible Landscaping: The design of farms, forests, yards and gardens featuring food-producing and/or ornamental plants. Plants grown include fruit and nut trees, berry bushes, vegetables, herbs, edible flowers, and other ornamental plants.

Family Farm: There is no hard-and-fast definition of a family farm. Based on the Agricultural Resource Management Survey, it is a business mostly owned by the operator and individuals related to the operator by blood, marriage, or adoption, including relatives that do not live in the operator household.

Farm: Any place from which \$1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the year.

Farm Size Class: A categorization of farms by its acreage.

Farm Size: A categorization of farms by gross cash farm income (GCFI).

Farmers Market: A market that operates multiple times a year and is organized for the purposes of facilitating personal connections that create mutual benefits for local farmers, shoppers, and communities. It is characterized by farms selling their products directly to the public.

Farmland Fragmentation: the process typically associated with urbanization wherein farmlands become non-contiguous and intermixed with non-farm uses, resulting in an overall loss in agricultural production and efficiency.

Forest Gardening: the art and science of incorporating fruit and nut trees, shrubs, herbs, vine and perennial vegetables into a low-maintenance food production (agroforestry) system that mimics woodland ecosystems.

Food Hub: A business or organization that actively manages the aggregation, distribution, and marketing of source-identified food products, primarily from local and regional producers. They are designed for strengthening production capacity and access to wholesale, retail, and institutional markets.

Food Security: A household's ability to access nutritional food without limitations or restrictions.

Gross Cash Farm Income (GCFI): Annual income before expenses and includes income from cash receipts, farm-related cash income, and Government farm program payments.

H-2A Visa Program: A temporary agricultural program for agricultural employers who anticipate a shortage of domestic workers to bring non-immigrant foreign workers to the U.S. to perform

agricultural labor or services of a temporary or seasonal nature.

Horticultural products: fruits, vegetables, tree nuts, wine, essential oils, nursery stock, cut flowers, and hops.

Hydroponics: the method of growing plants in soil-less medium with added nutrients.

Large-scale (family) Farm: a farm that has a GCFl greater than \$1 million. Includes large farms (GCFl from \$1 million to \$4,999,999) and very large farms (GCFl greater than \$5 million).

Locavore: A person who eats food grown, raised, or produced locally whenever possible usually within 100 miles from home.

Mid-size (family) Farm: a farm that has a GCFl from \$350,000 to \$999,999.

Meat Slaughterhouse: A facility where live animals are slaughtered.

Meat Processor: A facility where animals are butchered, thereby turning meat into different cuts for human consumption. Note: a meat processing facility does not slaughter live animals.

Multiplier Effect: the number of times a dollar circulates through a locale. The higher the multiplier, the more times that dollar has been recycled.

Non-Family Farm: A farm operated as a collective, trust, or nonfamily corporation.

Not in Labor Force: People 16 years old and over; this category includes students, housewives, retired workers, seasonal workers interviewed in an off season who were not looking for work, institutionalized people, and people doing only incidental unpaid family work (less than 15 hours during the reference week).

Other Agricultural Land: Includes all cropland other than harvested cropland or other pasture and grazing land that could have been used for crops without additional improvements. It includes cropland idle, used for cover crops or soil improvement, cropland which all crops failed or were abandoned, and cropland in cultivated summer fallow.

Pasture-raised: Pasture-raised animals receive a significant portion of their nutrition from organically managed pasture and stored dried forages.

Regional Agricultural Work Group: The agricultural working group for the COG region, comprised of local agricultural marketing development specialists, soil conservation district staff, some planning and land preservation offices, as well as several farmers and nonprofit technical assistance providers.

School Garden: An area of land on school grounds for growing vegetables, flowers, herbs, trees, shrubs, and other plants. It is dedicated for learning, recreation, and consumption.

Small (family) Farm: a farm that has a GCFl less than \$350,000. Includes retirement farms, farms where operator's principal occupation is off-farm, farms with low sales (GCFl less than \$150,000), and farms with moderate sales (GCFl from \$150,000 to \$349,999).

Total Maximum Daily Load (TMDL): Established under the 1972 Clean Water Act, the requirement that the maximum amount of a pollutant (such as nutrients, metals, herbicides, etc.) that a

waterbody can receive and still safely meet water quality standards, be calculated, and that impaired waters be listed.

Transfer Development Rights (TDRs): A zoning statute that permits the owner of a property zoned for low density development, agriculture, or conservation use to sell and transfer the development rights to another property owner located in a higher density receiving area.

United States Department of Agriculture (USDA): The federal department created in 1862 that administers programs that provide services for farmers including research, soil conservation, and efforts that help support the nation's farming economy.

Urban Agriculture/Farm/Garden: The practice of growing or producing food in a city or heavily populated town or municipality. It is not to be confused with community gardening, homesteading or subsistence farming.

Vertical Farming: the practice of producing food in vertically stacked layers, vertically inclined surfaces and/or integrated in other structures (such as in a skyscraper, used warehouse, or shipping container).

Vineyard: A farm that grows grape-bearing vines, which are grown mainly for winemaking, but also for raisins, table grapes, and non-alcoholic grape juice.

Washington Agricultural Region: The approximately 8,600 square mile area in and around the District of Columbia, comprised of the following counties and jurisdictions – **Maryland:** Anne Arundel, Calvert, Carroll, Charles, Frederick, Howard, Montgomery, Prince George's, St. Mary's, and Washington; **Virginia:** Arlington, Clarke, Culpeper, Fairfax, Fauquier, King George, Loudoun, Prince William, Rappahannock, and Stafford; **West Virginia:** Jefferson; **District of Columbia.**

Washington Metropolitan Area: The Washington metropolitan statistical area, defined by the U.S. Census. It includes the following jurisdictions and municipalities – **Maryland:** Bladensburg, Bowie, Calvert County, Charles County, College Park, Frederick, Frederick County, Gaithersburg, Greenbelt, Montgomery County, Prince George's County, Rockville, and Takoma Park; **Virginia:** Alexandria, Arlington County, Clarke County, Fairfax, Fairfax County, Falls Church, Fauquier County, Fredericksburg, Loudoun County, Manassas, Manassas Park, Prince William County, Stafford County, Spotsylvania County, and Warren County; **District of Columbia.**

Western Shore: The region of Maryland and Virginia west of the Chesapeake Bay.

Winery: An establishment where wine is made.

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