

Executive Summary

Collectively, the agriculture, natural resources, and food industries are significant contributors to the economy of the state of Florida. The economic contributions of these industries were evaluated for calendar year 2016 to update previous reports from the Economic Impact Analysis Program and to provide current information for the purpose of informed public policy.

Licensed *IMPLAN*® regional economic modeling software (Version 3) and associated Florida state and county databases (*IMPLAN*® Group LLC) for 2016 were used to estimate the total economic contributions of selected industry sectors associated with agriculture, natural resources, and food. Analyses of this type capture not only the direct economic activity within these industries, but the indirect activity supported throughout the regional economy via supply chain relationships and induced activity supported by the re-spending of household income. This analysis includes 121 industry sectors that represent the broad array of activities encompassed by commodity production, manufacturing, distribution, and supporting services associated with agriculture and food as well as natural-resources management. Economic contributions are measured in terms of employment, industry output, value added, exports, labor income, other property income, and business taxes. A glossary of economic terms is provided in this document for reference.

The overall economic contributions of Florida agriculture, natural resources, and food industries in 2016 are summarized in Table ES1:

- Direct employment of 1.683 million full-time and part-time jobs, and total employment contributions (including multiplier effects in other sectors) of 2.294 million jobs, representing 19.9 percent of the state workforce.
- Direct industry output or sales revenues of \$165.51 billion, and total output contributions of \$263.20 billion.
- Foreign and domestic exports of \$47.70 billion that bring new money into the Florida economy.
- Total value added contributions of \$137.23 billion, representing 14.7 percent of Gross State Product (equivalent to Gross Domestic Product).
- Total labor income contributions of \$80.82 billion, which includes employee wages, fringe benefits, and proprietor income.
- Total other property income contributions of \$43.62 billion representing rents, dividends, interest, royalties, etc.
- Total local, state and federal government tax contributions on production and imports of \$12.79 billion.

Across the various industry groups, total employment and value added contributions were largest for Food and kindred products distribution (1.62 million jobs; \$92.96 billion), which includes food service establishments and retail food stores, followed by Agricultural inputs and services (250,632 jobs; \$13.52 billion), Crop, livestock, forestry, and fisheries production (176,569 jobs; \$8.77 billion), Food and kindred product manufacturing (124,766 jobs; \$12.96 billion), Forest product manufacturing (45,570 jobs; \$4.62 billion), Mining (36,911 jobs;

\$2.43 billion), and Nature-based recreation – golf courses (36,979 jobs; \$1.97 billion). Excluding the Food and kindred products distribution industry group, the total value added contribution was \$44.27 billion (4.7% of Gross State Product), and the employment contribution was 671,428 jobs (5.8% of state workforce).

Economic contribution estimates were also aggregated into seven agricultural commodity groups that have identifiable market-chain linkages between production and processing/manufacturing sectors. Resulting total employment and value added contributions for these commodity groups include: Environmental horticulture (174,418 jobs; \$8.31 billion), Fruit and vegetable farming and processing (61,529 jobs; \$3.62 billion), Forestry and forest products manufacturing (52,040 jobs; \$5.08 billion), Grain and oilseed farming and processing (39,989 jobs; \$2.50 billion), Livestock farming and animal products manufacturing (27,112 jobs; \$1.62 billion), Fishing and seafood products (12,142 jobs; \$821 million), and Sugarcane farming and refining (11,230 jobs; \$1.11 billion).

Geographically, the size and composition of agriculture, natural resources, and food industries varies dramatically across the state of Florida due to differences in climate, natural resource endowments, population, and settlement patterns. The largest economic contributions occur in the major metro areas of Miami-Ft. Lauderdale, Orlando, Tampa-St. Petersburg, Sarasota-Bradenton, and Jacksonville, where there are large demands for food and kindred products, and a large workforce available for the industry (Figure ES1). The eight largest counties in terms of total employment and value added contributions were Miami-Dade (274,488 jobs; \$18.00 billion), Orange (199,152 jobs; \$12.89 billion), Broward (186,187 jobs; \$11.50 billion), Palm Beach (174,025 jobs; \$10.80 billion), Hillsborough (170,030 jobs; \$11.76 billion), Duval (116,057 jobs; \$8.53 billion), Pinellas (98,210 jobs; \$5.39 billion), and Polk (82,077 jobs; \$6.12 billion), as mapped in Figure ES2. Additional detailed information on economic contributions by industry group and sector in individual Florida counties is available in Appendix B.

During the ten year period of 2007 to 2016, direct employment in Florida's agriculture, natural resources, and food industries increased by 26.3 percent, or an average annual rate of 2.9 percent (9 years change), and total value added contributions grew by 23.3 percent, or 2.6 percent annually, in inflation adjusted terms (Figure ES3). Growth in total employment contributions during this period was highest for Agricultural inputs and services (39.8%) and Nature-based recreation – golf courses (37.6 %), followed by Food and kindred products distribution (28.8%), Food and kindred products manufacturing (20.9%), and Mining (5.6%), while employment contributions declined in Forest products manufacturing (-10.2%) and Crop, livestock, forestry and fisheries production (-12.9%) due to changes in labor markets and automation technology. Complete information on trends in economic contributions for all industry groups and sectors over the 2007-16 period are provided in Appendix A.

Table ES1. Summary of economic contributions of agriculture, natural resources, and food industry groups in Florida in 2016.

| Industry Group | Direct Employment (Jobs) | Direct Output (M\$) | Domestic and International Exports (M\$) | Employment Contrib. (Jobs) | Output Contrib. (M\$) | Value Added Contrib. (M\$) | Labor Income Contrib. (M\$) | Other Property Income Contrib. (M\$) | Production and Imports Tax Contrib. (M\$) |
|--|--------------------------|---------------------|--|----------------------------|-----------------------|----------------------------|-----------------------------|--------------------------------------|---|
| Food & Kindred Products Distribution | 1,213,129 | 92,755 | 15,219 | 1,622,844 | 157,058 | 92,959 | 54,469 | 28,123 | 10,367 |
| Agricultural Inputs & Services | 187,630 | 18,521 | 8,631 | 250,632 | 28,709 | 13,522 | 8,803 | 4,073 | 646 |
| Crop, Livestock, Forestry & Fisheries Production | 144,130 | 10,593 | 5,179 | 176,569 | 15,634 | 8,769 | 6,339 | 2,135 | 294 |
| Food & Kindred Products Manufacturing | 61,797 | 28,609 | 12,242 | 124,766 | 39,403 | 12,960 | 6,491 | 5,517 | 953 |
| Nature-based Recreation (Golf Courses) | 27,704 | 1,872 | 770 | 36,979 | 3,306 | 1,970 | 1,168 | 703 | 99 |
| Mining | 25,907 | 4,369 | 1,032 | 36,911 | 6,367 | 2,431 | 852 | 1,389 | 191 |
| Forest Products Manufacturing | 22,403 | 8,793 | 4,629 | 45,570 | 12,721 | 4,615 | 2,693 | 1,684 | 238 |
| Total | 1,682,699 | 165,512 | 47,702 | 2,294,272 | 263,197 | 137,226 | 80,815 | 43,624 | 12,788 |

Employment represents full-time and part-time jobs. Monetary values are given in millions of dollars. Total contribution estimates include regional multiplier effects. Source: *IMPLAN*® model and state/county data for Florida (*IMPLAN*® Group LLC) and authors' calculations.

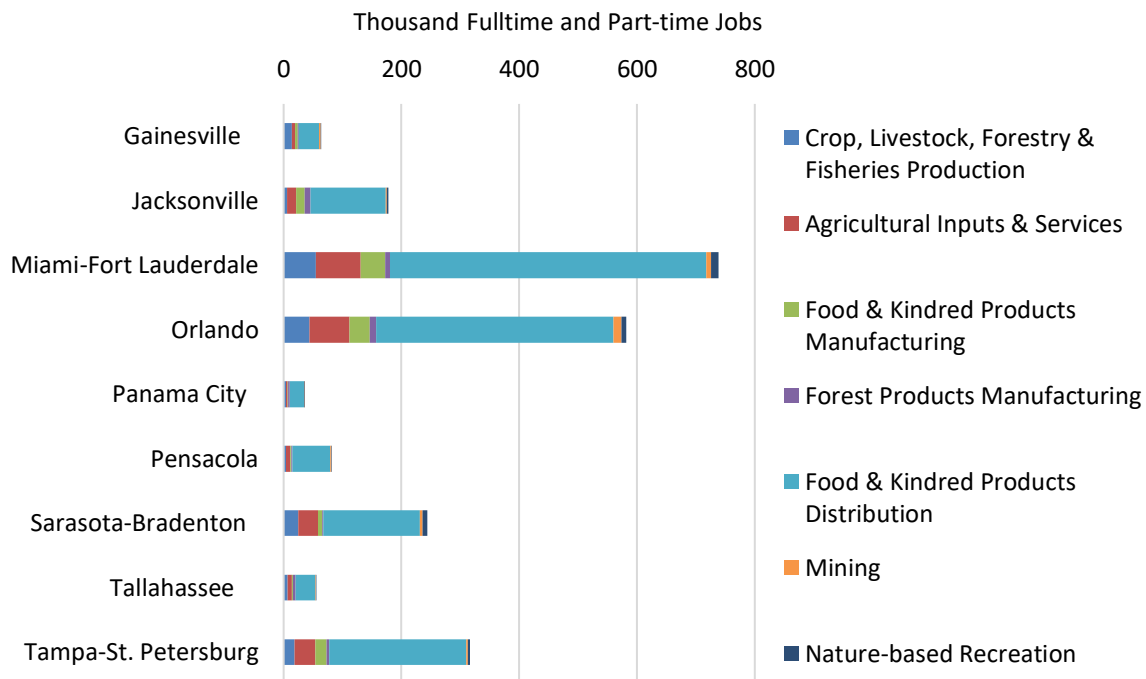


Figure ES1. Total employment contributions of agriculture, natural resources, and food industries in Florida regions in 2016. Estimates include regional multiplier effects. Source: *IMPLAN*® data for Florida counties.

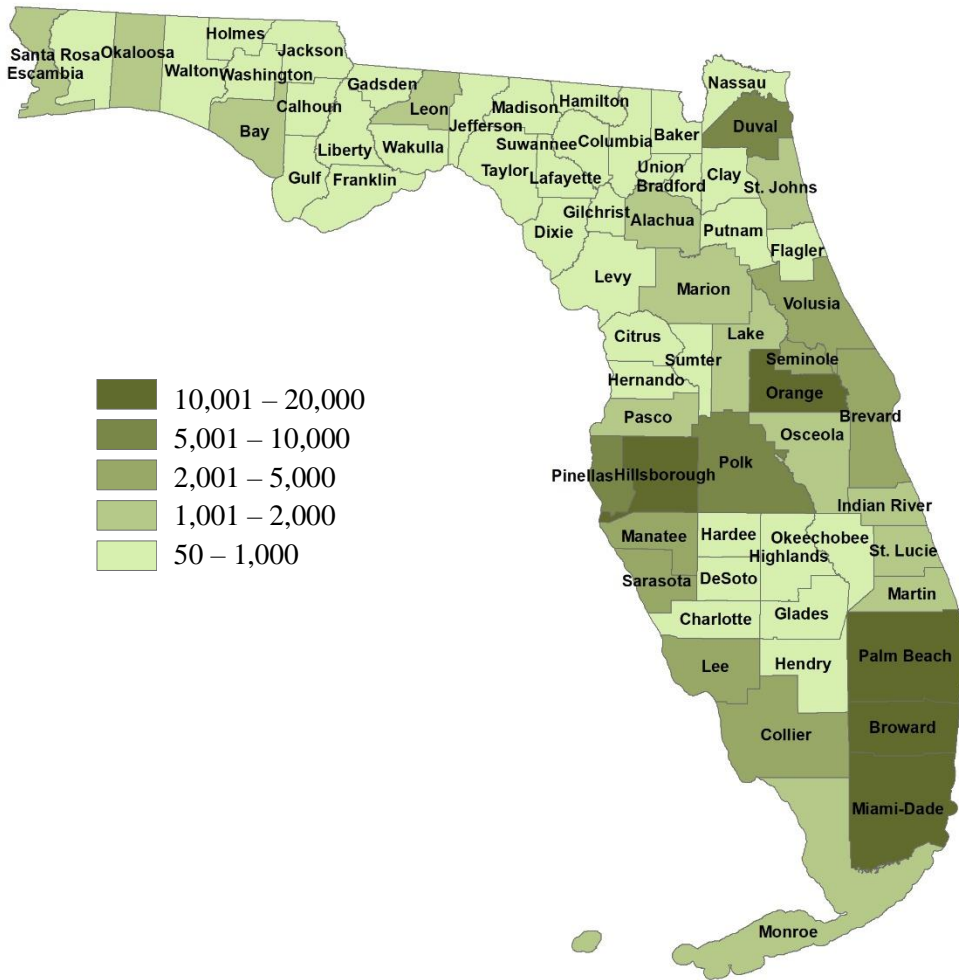


Figure ES2. Map of value added (GSP) contributions by agriculture, natural resources, and food industries in Florida counties in 2016. Values are expressed in millions of dollars, and include regional multiplier effects. Source: IMPLAN[®] data for Florida counties and ArcGIS software.

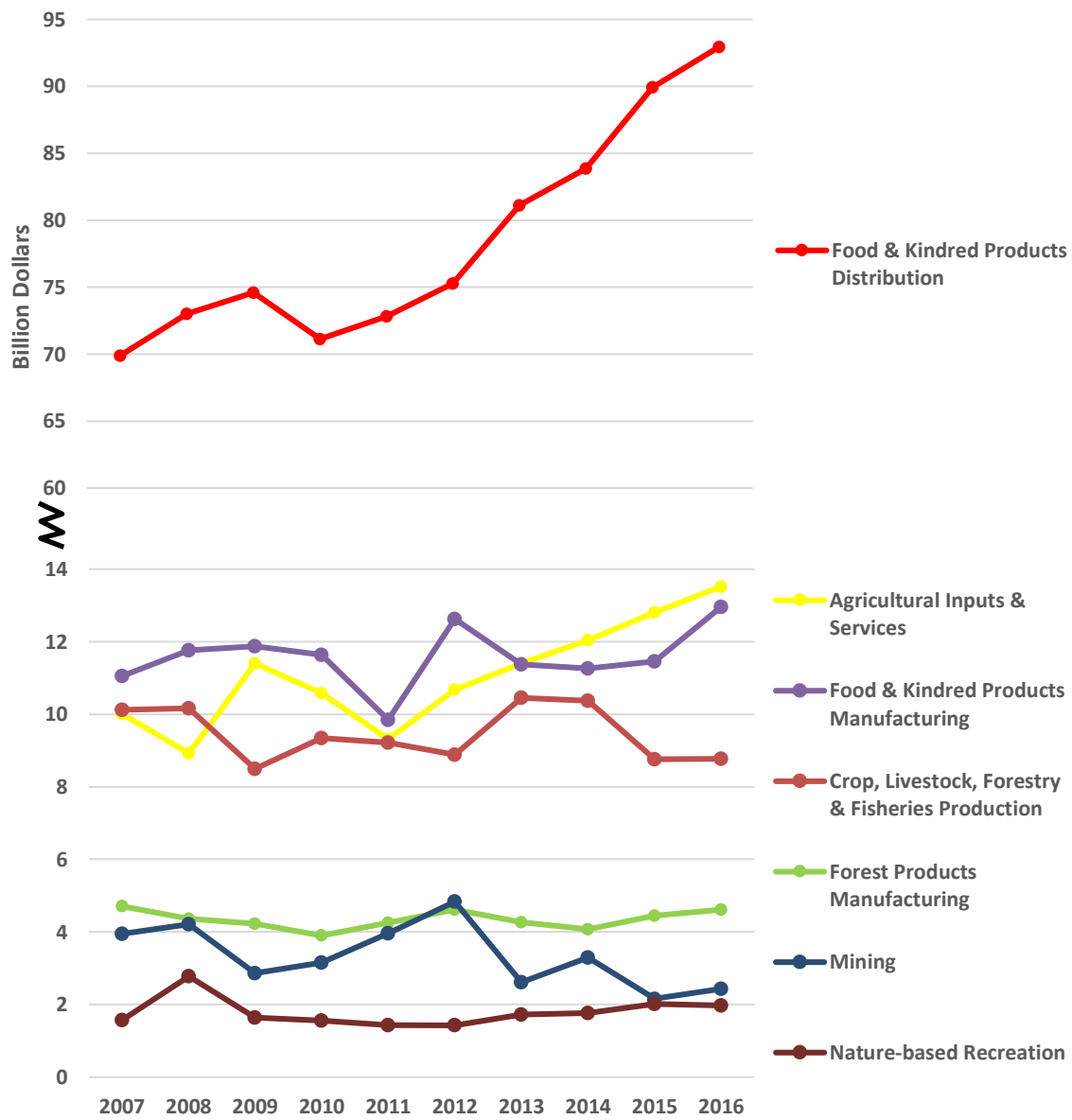


Figure ES3. Trends in total value added (GSP) contributions by agriculture, natural resources, and food industry groups in Florida, 2007-16. Values are expressed in 2016 dollars. Estimates include regional multiplier effects. Source: IMPLAN® data for Florida.

Glossary of Economic Impact Terms

Contribution (economic) represents the gross change in economic activity associated with an industry, event, or policy in an existing regional economy.

Employee compensation is comprised of wages, salaries, commissions, and benefits such as health and life insurance, retirement, and other forms of cash or non-cash compensation.

Employment is a measure of the number of jobs involved, including full-time, part-time, and seasonal positions. It is not a measure of full-time equivalents (FTE).

Exports are sales of goods to customers outside the region in which they are produced, which represents a net inflow of money to the region. This also applies to sales of goods and services to customers visiting from other regions.

Final Demand represents sales to final consumers, including households, governments, and exports from the region.

Gross Regional Product is a measure of total economic activity in a region, or total income generated by all goods and services. It equals the total value added by all industries in that region, and is equivalent to Gross Domestic Product for the nation.

IMPLAN[®] is a computer-based input-output modeling system that enables users to create regional economic models and multipliers for any region consisting of one or more counties or states in the United States. The current version of the IMPLAN[®] software, version 3, accounts for commodity production and consumption for 536 industry sectors, 10 household income levels, taxes to local/state and federal governments, capital investment, imports and exports, transfer payments, and business inventories. Regional datasets for individual counties or states are purchased separately. The IMPLAN[®] software and regional data are licensed by IMPLAN[®] Group, LLC, Huntersville, NC.

Imports are purchases of goods and services originating outside the region of analysis.

Income is the money earned within the region from production and sales. Total income includes labor income such as wages, salaries, employee benefits, and business proprietor income, plus other property income.

Taxes on Production and Imports are taxes paid to governments by individuals or businesses for property, excise, and sales taxes, but do not include income taxes.

Input-Output (I-O) model and Social Accounting Matrix (SAM) is a representation of the transactions between industry sectors within a regional economy that captures what each sector purchases from every other sector to produce its output of goods or services. Using such a model, flows of economic activity associated with any change in spending or employment may be traced backwards through the supply chain.

Local refers to goods and services that are sourced from within the region, which may be defined as a county, multi-county cluster, or state. Non-local refers to economic activity originating outside the region.

Margins represent the portion of the purchaser price accruing to the retailer, wholesaler, and producer/manufacturer in the supply chain. Typically, only the retail margins of many goods purchased by consumers accrue to the local region, as the wholesaler, shipper, and manufacturer often lie outside the local area.

Multipliers capture the total effects, both direct and secondary, in a given region, generally as a ratio of the total change in economic activity in the region relative to the direct change. Multipliers are derived from an I-O model of the regional economy. Multipliers may be expressed as ratios of sales, income, or employment, or as ratios of total income or employment changes relative to direct sales. Multipliers express the degree of interdependency between sectors in a region's economy and therefore vary considerably across regions and sectors. A **sector-specific multiplier** gives the total changes to the economy associated with a unit change in output or employment in a given sector (i.e., the **direct or initial economic effect**) being evaluated. **Indirect effects multipliers** represent the changes in sales, income, or employment within the region in backward-linked industries supplying goods and services to businesses (e.g., increased sales in input supply firms resulting from more industry sales). **Induced effects multipliers** represent the increased sales within the region from household spending of the income earned in the direct and supporting industries for housing, utilities, food, etc. An **imputed multiplier** is calculated as the ratio of the total impact divided by direct effect for any given measure (e.g., output, employment).

Other property income represents income received from investments such as corporate dividends, royalties, property rentals, or interest on loans.

Output is the dollar value of a good or service produced or sold, and is equivalent to sales revenues plus changes in business inventories.

Producer prices are the prices paid for goods at the factory or point of production. For manufactured goods, the purchaser price equals the producer price plus a retail margin, a wholesale margin, and a transportation margin. For services, the producer and purchaser prices are equivalent.

Proprietor income is income received by non-incorporated private business owners or self-employed individuals.

Purchaser prices are the prices paid by the final consumer of a good or service.

Region or Regional Economy is the geographic area and the economic activity it contains for which contributions are estimated. It may consist of an individual county, an aggregation of several counties, a state, or aggregation of states. These aggregations are sometimes defined on the basis of worker commuting patterns.

Sector is an individual industry or group of industries that produce similar products or services, or have similar production processes. Sectors are classified according to the North American Industrial Classification System (NAICS).

Value Added is a broad measure of income, representing the sum of employee compensation, proprietor income, other property income, indirect business taxes and capital consumption (depreciation). Value added is a commonly used measure of the contribution of an industry to a regional economy because it avoids double counting of intermediate sales.