

# Economic Contributions of Agriculture, Natural Resources, and Food Industries in Florida in 2014<sup>1</sup>

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## Executive Summary

Agriculture, natural resources, and food industries remain a significant force in the economy of Florida, and informed public policy demands recognition of the economic contributions of these industries. Economists at the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) evaluated the economic contributions of the agriculture, natural resources, and food industries for calendar year 2014 to update previous reports and provide current information on economic trends.

This analysis described in this publication was conducted using the *Implan* regional economic modeling system and associated state and county databases (*IMPLAN* Group LLC) to estimate economic multipliers and contributions for over 500 different industry sectors. Multipliers capture the indirect and induced economic activity generated by re-spending of income or sales revenues in a regional economy. The analysis included 121 industry sectors representing the broad array of activities encompassed by agricultural and natural-resource commodity production, manufacturing, distribution, and supporting services in Florida. Economic contributions can be measured in terms of employment, industry output, value added, exports, labor income, other property income, and business taxes. A

glossary of economic terms used in this report is provided following this summary.

The economic contributions of Florida agriculture, natural resources, and food industries for 2014 are summarized in Table ES1, and include

- Industry output or sales revenues of \$155.15 billion
- Foreign and domestic exports of \$59.61 billion
- 1,565,167 full-time and part-time direct jobs in agriculture, natural resources, and food industries, representing 13.8 percent of all jobs in the state
- An additional 645,424 jobs indirectly connected to these industries for a total employment impact of 2,210,591 jobs, representing 19.2 percent of total state employment
- Total value added impacts (including multiplier effects) of \$127.34 billion, representing 14.1 percent of Gross State Product
- Total labor income impacts of \$77.19 billion, including employee wages, fringe benefits, and business proprietor income
- Total property income impacts of \$37.28 billion, representing rents, dividends, interest, royalties, etc.
- Taxes on production and imports paid to local, state, and federal governments totaling \$12.87 billion

Across the various industry groups, total employment and value added impacts were largest for food and kindred

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products distribution (1.416 million jobs; \$72.88 billion), which includes food service establishments (restaurants) and retail food stores, followed by agricultural inputs and services (269,421 jobs; \$14.71 billion); crop, livestock, forestry, and fisheries production (214,299 jobs; \$14.78 billion); food and kindred product manufacturing (144,385 jobs; \$13.01 billion); forest product manufacturing (69,222 jobs; \$6.02 billion); mining (58,313 jobs; \$3.99 billion); and nature-based recreation (38,653 jobs; \$1.95 billion). Excluding the food and kindred products distribution industry group, total value added impacts represented 5.59 percent of Gross State Product and employment contributions were 6.03 percent of total state employment.

Information on economic contributions was also evaluated for seven agricultural commodity groups that have identifiable market-chain linkages between production and processing/manufacturing sectors. The total employment and value added contributions were highest for the environmental horticulture group (179,580 jobs; \$8.85 billion), followed by fruit and vegetable farming and processing (81,477 jobs; \$6.22 billion), forestry and forest products (77,621 jobs; \$6.59 billion), livestock and dairy farming and animal products manufacturing (41,309 jobs; \$2.78 billion), sugarcane farming and refined sugar manufacturing (17,633 jobs; \$1.64 billion), fishing and seafood products (14,663 jobs; \$873 million), and grain and oilseed farming and processing (3,439 jobs; \$310 million).

Geographically, the size and composition of agriculture, natural resources, and related food industries varies dramatically across the state of Florida due to differences in climate, natural resource endowments, and population and settlement patterns. The largest economic contributions occurred 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 (Table ES1). The eight largest counties in terms of total employment and value added impacts were Miami-Dade (237,198 jobs; \$14.25 billion), Orange (180,412 jobs; \$10.76 billion), Hillsborough (165,789 jobs; \$11.17 billion), Palm Beach (155,073 jobs; \$9.18 billion), Broward (159,069 jobs; \$8.31 billion), Duval (119,733 jobs; \$8.22 billion), Polk (95,580 jobs; \$6.651 billion), and Pinellas (79,858 jobs; \$3.69 billion). Additional detailed information on economic contributions in individual Florida counties is available in the Appendix.

Direct employment in agriculture, natural resources, and food industries in Florida grew from 1.252 million jobs in 2001 to a peak of 1.351 million jobs in 2008, before

declining during the Great Recession of 2009/10, and then recovering to 1.565 million jobs in 2014, which was 24.9 percent higher than 2001, representing an average annual growth rate of 1.9 percent. Overall growth in industry contributions during this period reflected an increase in exports of Florida products to domestic and world markets. Average annual growth in employment contributions during 2001–14 was highest for mining (11.9 %), followed by agricultural inputs and services (8.2 %), and food and kindred products distribution (3.3 %), while industry groups that had negative growth in employment contributions were forest products manufacturing (-0.01 %); food and kindred products manufacturing (-0.02%); crop, livestock, forestry, and fisheries production (-1.2 %); and nature-based recreation (-4.7%).

## 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.

**Impact or total impact** is the net change in total regional economic activity (e.g., output or employment) resulting from a change in final demand, direct industry output, or direct employment, estimated based on regional economic multipliers.

**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)** are representations of the transactions between industry sectors within a regional economy. They capture what each sector purchases from every other sector to produce that sector's output of goods or services. Using these models, 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, shipper, and manufacturer in the supply chain. Typically, only the retail margins of many goods purchased by consumers accrue to the local region because 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 nursery 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 economic activity contained in a geographic area for which impacts are estimated. The region may be an individual county, an aggregation of several counties, a state, or several states. These regions are sometimes defined on the basis of worker commuting patterns.

**Sectors** are individual industries or groups of industries that produce similar products or services, or that 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.

**Table ES-1. Summary of economic contributions of agriculture, natural resources, and food industries in Florida in 2014, by industry groups and Florida regions**

|                                                                                                                                                                                                                                                                                                                                                                  | Direct<br>Employ-<br>ment<br>(Jobs) | Direct<br>Industry<br>Output<br>(M\$) | Foreign<br>and<br>Domestic<br>Exports<br>(M\$) | Industry<br>Output<br>Impacts<br>(M\$) | Employ-<br>ment<br>Impacts<br>(Jobs) | Value<br>Added<br>Impacts<br>(M\$) | Labor<br>Income<br>Impacts<br>(M\$) | Other<br>Property<br>Income<br>Impacts<br>(M\$) | Business<br>Tax<br>Impacts<br>(M\$) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|---------------------------------------|------------------------------------------------|----------------------------------------|--------------------------------------|------------------------------------|-------------------------------------|-------------------------------------------------|-------------------------------------|
| <b>Industry Group</b>                                                                                                                                                                                                                                                                                                                                            |                                     |                                       |                                                |                                        |                                      |                                    |                                     |                                                 |                                     |
| Crop, livestock, forestry, & fisheries production                                                                                                                                                                                                                                                                                                                | 126,716                             | 11,040.4                              | 7,192.3                                        | 22,380.3                               | 214,299                              | 14,776.1                           | 8,255.8                             | 5,801.1                                         | 719.2                               |
| Agricultural inputs & services                                                                                                                                                                                                                                                                                                                                   | 174,998                             | 18,163.6                              | 10,809.5                                       | 32,096.5                               | 269,421                              | 14,714.3                           | 9,508.2                             | 4,248.1                                         | 958.0                               |
| Food & kindred products manufacturing                                                                                                                                                                                                                                                                                                                            | 59,504                              | 26,372.1                              | 10,344.1                                       | 38,904.9                               | 144,385                              | 13,010.7                           | 7,072.2                             | 4,714.5                                         | 1,224.0                             |
| Forest products manufacturing                                                                                                                                                                                                                                                                                                                                    | 21,168                              | 8,253.0                               | 5,667.4                                        | 15,136.3                               | 69,222                               | 6,022.9                            | 3,620.1                             | 1,978.4                                         | 424.3                               |
| Mining                                                                                                                                                                                                                                                                                                                                                           | 27,156                              | 6,929.3                               | 3,398.3                                        | 11,407.2                               | 58,313                               | 3,985.9                            | 2,161.1                             | 1,496.4                                         | 328.4                               |
| Food & kindred products distribution                                                                                                                                                                                                                                                                                                                             | 1,129,529                           | 82,690.3                              | 21,258.1                                       | 120,604.8                              | 1,416,299                            | 72,881.5                           | 45,313.9                            | 18,472.4                                        | 9,095.2                             |
| Nature-based recreation                                                                                                                                                                                                                                                                                                                                          | 26,096                              | 1,703.0                               | 936.5                                          | 3,364.2                                | 38,653                               | 1,950.7                            | 1,262.1                             | 571.6                                           | 116.9                               |
| Total all industries                                                                                                                                                                                                                                                                                                                                             | 1,565,167                           | 155,151.8                             | 59,606.2                                       | 243,894.3                              | 2,210,591                            | 127,342.2                          | 77,193.5                            | 37,282.6                                        | 12,866.0                            |
| <b>Florida Region</b>                                                                                                                                                                                                                                                                                                                                            |                                     |                                       |                                                |                                        |                                      |                                    |                                     |                                                 |                                     |
| Miami-Fort Lauderdale                                                                                                                                                                                                                                                                                                                                            | 490,537                             | 46,491                                | 19,810                                         | 73,076                                 | 684,957                              | 40,913                             | 25,772                              | 11,175                                          | 4,080                               |
| Orlando                                                                                                                                                                                                                                                                                                                                                          | 419,850                             | 42,596                                | 20,822                                         | 67,973                                 | 605,925                              | 34,497                             | 20,348                              | 10,671                                          | 3,501                               |
| Tampa-St. Petersburg                                                                                                                                                                                                                                                                                                                                             | 215,375                             | 22,560                                | 10,518                                         | 35,972                                 | 308,812                              | 18,498                             | 11,248                              | 5,330                                           | 1,930                               |
| Sarasota-Bradenton                                                                                                                                                                                                                                                                                                                                               | 171,076                             | 13,918                                | 5,051                                          | 21,006                                 | 224,751                              | 11,342                             | 7,350                               | 2,904                                           | 1,080                               |
| Jacksonville                                                                                                                                                                                                                                                                                                                                                     | 101,536                             | 13,251                                | 7,361                                          | 21,110                                 | 156,512                              | 10,359                             | 5,704                               | 3,506                                           | 1,111                               |
| Pensacola                                                                                                                                                                                                                                                                                                                                                        | 58,360                              | 4,405                                 | 1,909                                          | 6,770                                  | 76,410                               | 3,481                              | 2,204                               | 812                                             | 394                                 |
| Gainesville                                                                                                                                                                                                                                                                                                                                                      | 42,781                              | 4,696                                 | 2,540                                          | 6,795                                  | 59,123                               | 3,227                              | 1,745                               | 1,178                                           | 287                                 |
| Tallahassee                                                                                                                                                                                                                                                                                                                                                      | 40,068                              | 5,031                                 | 3,046                                          | 7,602                                  | 57,688                               | 3,188                              | 1,755                               | 1,129                                           | 294                                 |
| Panama City                                                                                                                                                                                                                                                                                                                                                      | 25,584                              | 2,204                                 | 1,135                                          | 3,590                                  | 36,414                               | 1,838                              | 1,067                               | 579                                             | 190                                 |
| Employment represents full-time and part-time jobs. Monetary values are given in millions dollars.<br>Total impact estimates include regional multiplier effects.<br>Florida regions are functional economic areas defined by the U.S. Bureau of Economic Analysis.<br>Source: <i>IMPLAN</i> model and state/county data for Florida ( <i>IMPLAN</i> Group LLC). |                                     |                                       |                                                |                                        |                                      |                                    |                                     |                                                 |                                     |