

ECONOMIC IMPACTS of AGRICULTURE in EIGHT NORTHEASTERN STATES



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The northeastern region of the United States comprises 5 percent of the United States land mass but houses 20 percent of the population.¹ Even within this relatively small, densely population area, agriculture, forestry and fisheries are important economic components at the household, state and regional levels. At the request of Farm Credit East, we conducted a study to document and ascertain the significance in the economies of eight northeastern states² of the agriculture sector, defined broadly as including four Fs: farming, food, forestry and fisheries.³

Because a state's agriculture sector purchases goods and services from other industries in the state and hires

local labor, its economic impact cascades throughout the state's entire economy, resulting in a "multiplier" or economic stimulus effect when these spillover effects are taken into account. As measured in the eight states under study using data from 2012, agriculture contributed \$99.4 billion to regional total sales or \$2,312 per resident and generated 474,482 jobs.

The changing structure of agriculture

To put the economic impact estimates in context, it is worthwhile to highlight some of the evolving changes affecting the structure of agriculture in the eight states. As shown in Figure 1, the number of mid-sized farms is declining

¹U.S. Bureau of the Census interactive list of U.S. states, including their (2012) population and land mass: <http://quickfacts.census.gov/qfd//index.html>.

²Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. Other Northeastern states (Pennsylvania, Delaware, and Maryland) were not included in the request. Thus, the reported impacts underestimate the impacts for the entire Northeastern region.

³We defined the agricultural sector more specifically as encompassing agricultural production (i.e., crops, livestock, fisheries and forestry) and farm, forestry and fishery/seafood processing that is closely tied to the underlying production.



while the number of small and large farms is increasing. In fact, six of the eight states included are among the 16 states nationally where the total number of farms increased between 2007 and 2012. While small farms are able to capture niche markets or supply locally grown products desired by residents, the number of large farms (over 1,000 acres) are able to exploit scale economies and compete in national markets.

As with the entire nation, total land in farms in the eight states declined between 2002 and 2012 (Table 1) dominated by declines in New York and New Jersey. However, southern New England states experienced a healthy growth of land in

farms while northern ones had relatively modest gains. Southern New England states had the most sagging change in total dollar farm sales as reported by the U.S. Department of Agriculture, with Rhode Island and Connecticut experiencing nominal sales growth below the inflation rate and Massachusetts sales barely keeping up with it. In contrast, New York experienced the highest positive growth in sales, followed by Vermont and Maine, all well above inflation.⁴

Notably, this study provides an updated and enhanced economic impact evaluation to a previous Farm Credit East report reporting \$71 billion in sales impact and approximately 379,000 jobs generated

in 2010 (Farm Credit East, 2012).⁵ For the *same six states and common 29 NAICS industries*⁶ in the two reports, between 2010 and 2012 the aggregate economic impact decreased 0.6 percent in statewide sales in dollars and 7 percent in the number of jobs.⁷

How did we measure economic impacts?

The study used the IMPLAN input-output model to estimate statewide economic impacts.⁸ The input-output IMPLAN model converts an industry's *direct sales* at the farm/processing plant/fishery gate (used as input) into *statewide sales* and *statewide jobs* generated (economic output indicators). Applying

⁴As defined by the Consumer Price Index for the Northeast, inflation grew by 28% between 2002 and 2012. In nominal dollars, farm sales grew 7.4% for Rhode Island, 17% in Connecticut, 28.1% in Massachusetts, 31.7% in New Hampshire, 34.3% in New Jersey, 64.1% in Vermont, 64.6% in Maine, and 73.7% in New York. Southern Atlantic states experience nominal sales growth between 74 and 106% in the same period. Based on other price inflation indicators that do not match the geographic region (e.g., national) or the commodity composition (national prices received by farmers) of farm sales, most states experience a negative growth in deflated or real dollar sales.

⁵Lopez, R.A. and C. Laughton. (2012). Northeast Agriculture: An Overlooked Economic Engine. A report by Farm Credit East.

⁶Note that the North America Industrial Classification System (NAICS) codes used do not exactly correspond to the Agriculture Census classifications. They also include industries beyond the farm or fishery gates into processing and related services such as landscape services which are not included in this article. In the current report, Support Activities for Agriculture and Forestry was split into two sectors (Agriculture and Forestry, respectively), thus comparing 30 of the 35 sectors included in the current report.

⁷Comparing 2010 and 2012 results from the two reports, sector specific trends in economic impacts include an 11percent decrease in aggregate statewide sales of greenhouse, nursery and floriculture production, a 7percent increase in dairy farming sales impact with large gains in fluid milk/butter manufacturing, which includes large increases in yogurt manufacturing. Additionally, forestry and fishery followed similar trends with reduction in the impact of commercial logging and fishing but increases in forest and fishery products processing, with the exception of an increase in aquaculture.

⁸Three standard models are most often referenced with respect to regional economic impacts: IMPLAN (IMpact analysis for PLANning; Minnesota IMPLAN Group, Inc.), RIMS II (Regional Input-output Modelling System; U.S. Department of Commerce), and REMI (Regional Economic Modelling, Inc.). IMPLAN is the most widely used.

the IMPLAN model to 2012 data (the latest available) from eight northeastern states, we relied on two indicators (outputs) of the economic importance of agriculture computed for each of 35 NAICS industries included for each state:

- *Total impact on statewide sales*, which is measured by sales generated directly from the industries (direct sales) plus spillover sales by other industries impacted; and
- *Total impact on state employment*, which includes full-time and part-time jobs generated.

Total impacts in the eight northeastern states in the study are simply the sum of impacts in each state. The results are presented below.

Economic impacts of agriculture

The aggregate economic impacts of agriculture (including forestry and fisheries) in the eight states in 2012 were significant as indicated by:⁹

- **\$99.4 billion impact on total sales or \$2,312 per resident**, and
- **474,482 jobs generated** across the eight states

Details are presented in Figure 2.¹⁰ It is worth noting that among the 35 industries, dairy manufacturing is the leading sector in economic impact, followed by paper mills. At the production stage, dairy farming was the leading sector in the region. Within farming, the second largest regional impact in sales (and jobs) is in the greenhouse, nursery and floriculture industry, closely followed by vegetable and melon farming which in fact is among the fastest growing sectors in the region. In the agricultural processing sector, dairy manufacturing is followed by fruit and vegetable processing and animal processing. The fishery sector, although important in some smaller states, is a distant third relative to agricultural and forestry production and processing in the region.

Although there is great variability in the distribution of total sales and job creation across these eight northeastern states, reflecting primarily their relative sizes, the findings attest to the value added nature of the region's agriculture, forestry and fishery industries, due in part to proximity to a large consumer base, which creates opportunities for continued economic growth and employment.

Table 2 summarizes the total and per resident impacts in each state. Total impacts on statewide sales ranged from

approximately \$1 billion in Rhode Island to \$46 billion in New York, with an average impact of \$12.4 billion — the approximate impact in Massachusetts. On a per resident basis, sales impacts ranged from \$1,003 in Rhode Island to \$10,506 in Vermont. Employment impacts ranged from 6,591 jobs generated in Rhode Island to 193,497 in New York. It is clear that agriculture clearly plays a significant economic role in the lives of the region's residents.

Conclusions

Agriculture in the northeastern United States is characterized by being diverse, value-added oriented, and economically important to the population in at least 8 of the 11 states comprising the region. In 2012, the agriculture sector (including forestry and fisheries) in these states accounted for nearly \$100 billion in statewide sales and just under half a million jobs. This translates into \$2,312 per resident. Moreover, beyond these measured economic impacts, not included in this study is the value of ecosystem services, scenic views and social benefits derived from open space in farming and forestry in this region, which is significant, affecting the quality of life and social well-being of residents and of future generations.

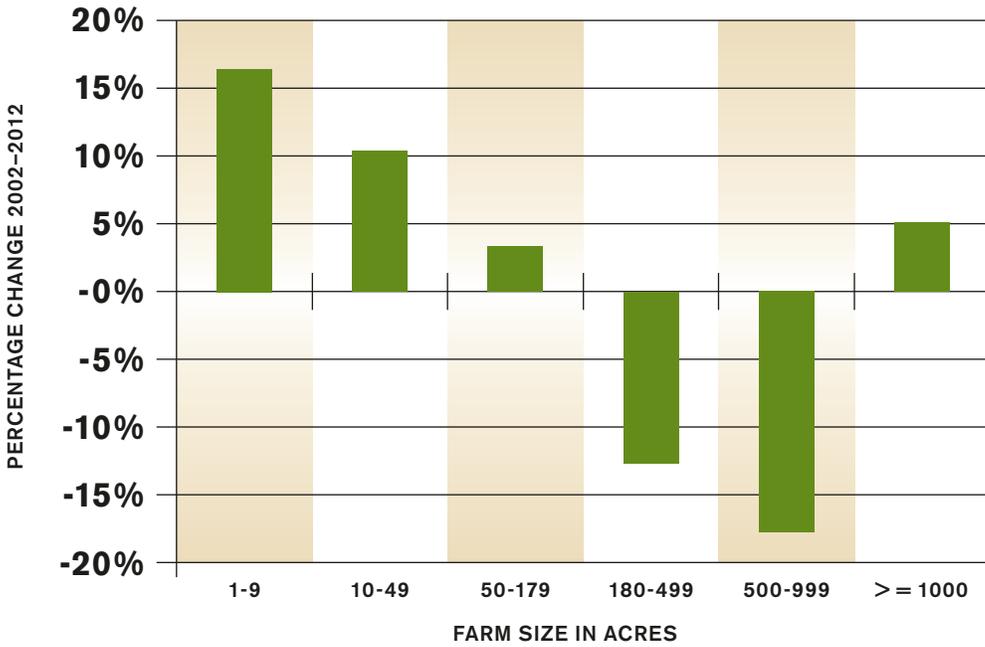


⁹Dollar amounts are rounded to one decimal place in these highlights from more precise figures in the tables.

¹⁰Some sectors in Figure 2 are aggregated for brevity such as dairy manufacturing containing all dairy processing products.

FIGURE 1

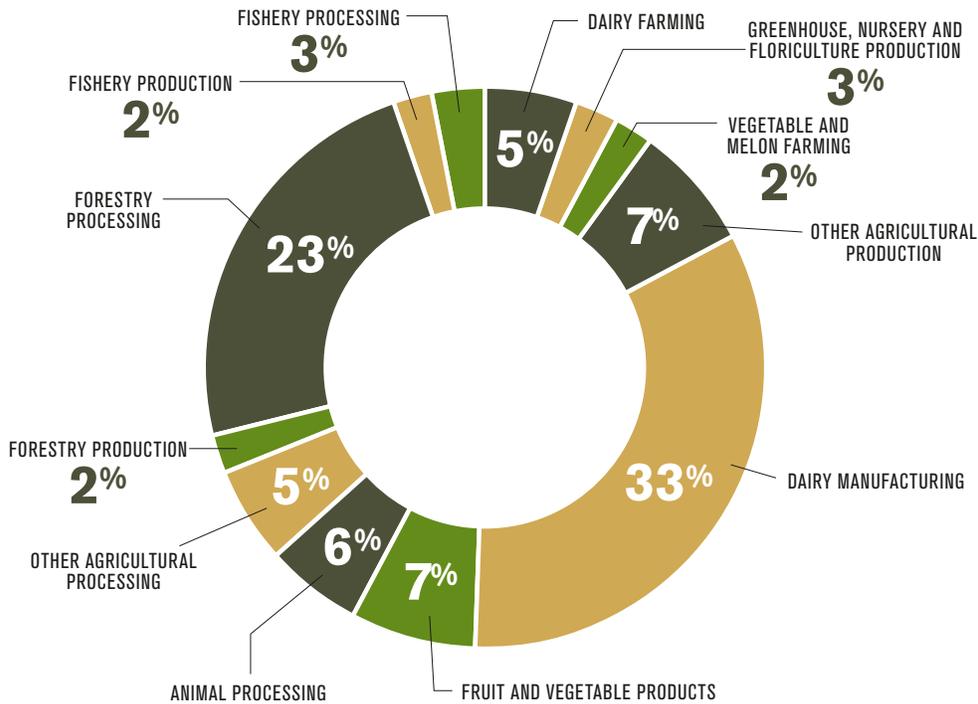
PERCENT CHANGE IN THE NUMBER OF FARMS IN EIGHT NORTHEASTERN STATES, BY SIZE



Source: U.S. Department of Agriculture, 2002 and 2012 Census of Agriculture, United States Summary and State Data (2004, 2014).

FIGURE 2

ECONOMIC IMPACTS OF AGRICULTURE IN EIGHT STATES, BY INDUSTRIES (\$ BILLION)



Note: States included are CT, MA, ME, NH, NJ, NY, RI and VT

TABLE 1

LAND IN FARMS AND FORESTRY IN EIGHT NORTHEASTERN STATES

	Number of Farms in 2012	Land in Farms (Acres)	Land in Farms Percent Change 2002 to 2012	Land in Forests (Million Acres)
Connecticut	5,977	436,539	22.2	1.5
Maine	7,755	1,454,104	1.0	16.9
Massachusetts	8,173	523,517	6.2	2.3
New Hampshire	4,391	474,065	6.6	4.5
New Jersey	9,071	715,057	-11.3	1.5
New York	35,537	7,183,576	-6.2	15.4
Rhode Island	1,243	69,589	13.7	0.3
Vermont	7,338	1,251,713	0.6	4.5
Total	79,485	12,108,160	-2.9	46.9

Source: U.S. Department of Agriculture, 2002 and 2012 Census of Agriculture, United States Summary and State Data (2004, 2014).

TABLE 2

ECONOMIC IMPACTS OF AGRICULTURE BY STATES

Eight Northeastern States	Direct Sales (\$ Million)	State-wide Impacts			Leading Sectors	
		Total Sales (\$ Million)	Dollar Sales per Resident	Total Jobs	Production	Processing
Connecticut	2,848	4,544	1,266	24,842	Greenhouse	Paper Mills
Maine	8,342	13,771	10,361	78,656	Commercial Fishing	Paper Mills
Massachusetts	7,693	12,419	1,869	60,008	Commercial Fishing	Fluid Milk
New Hampshire	1,905	3,103	2,349	18,743	Commercial Logging	Fluid Milk
New Jersey	7,254	11,663	1,316	55,317	Greenhouse	Fruit and Vegetable
New York	25,138	46,260	2,364	193,497	Dairy Farms	Fluid Milk
Rhode Island	0,724	1,054	1,003	6,591	Commercial Fishing	Fluid Milk
Vermont	3,501	6,577	10,506	36,828	Dairy Farms	Fluid Milk
Total	57,406	99,391	2,312	474,482	Dairy Farms	Fluid Milk

Note: A fuller description of some of the leading sectors are: Greenhouse=greenhouse, nursery and floriculture; Dairy Farms=dairy cattle and milk production; Fluid Milk=fluid milk and butter manufacturing (which includes yogurt); Fruit & Vegetable Processing=fruit and vegetable canning, picking and drying. Commercial Fishing, Commercial Logging, and Paper Mills are as described in the Table.

