

Economic Contributions of the Green Industry in the United States in 2018¹

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Abstract

The economic contributions of the green industry in the United States were estimated for 2018 using information on industry employment and wages, and economic multipliers from a U.S. *IMPLAN* economic model. Direct industry output for all sectors was estimated at \$159.57 billion (B), and total output contributions, including indirect and induced regional economic multiplier effects of export sales, were \$348.08 B. The total value added contribution to the Gross Domestic Product (GDP) was \$190.98 B, including labor income contributions of \$121.55 B, other property income contributions of \$16.01 B and business taxes paid to local, state and federal governments of \$25.84 B. The industry had direct employment of 1,599,662 fulltime and part-time individuals, and total employment contributions of 2,315,357 jobs in the broader economy. The largest individual industry sectors in terms of employment and GDP contributions were landscaping and horticultural services (1,460,669 jobs, \$221.89 B), greenhouse, nursery and floriculture production (217,574 jobs, \$28.69 B), and lawn and garden equipment and supplies stores (292,614 jobs, \$43.80 B). The top ten states in terms of employment contributions were California (264,913 jobs), Florida (203,482), Texas (161,151), Ohio (90,406), Pennsylvania (90,075), New York (90,266), Illinois (87,595), North Carolina (78,766), Michigan (77,719), and Georgia (66,527). Since 2013, green industry contributions in 2018 increased by 16.2% for employment and 17.3% for GDP in inflation-adjusted terms. Growth in the industry was highest for wholesale and retail trade, while production and manufacturing declined. Although the green industry has grown slowly in recent years, it remains an important contributor to national, state and local economies.

Index words: Sales, industry output, employment, value added, Gross Domestic Product, production, manufacturing, landscaping services, wholesale, retail, lawn and garden product line.

Significance to the Horticulture Industry

The green industry remains an important contributor to the U.S. economy and to individual states and regions. The green industry is extremely broad based, with the landscape services and wholesale-retail trade sectors existing in virtually all communities in the nation. In contrast, the production and manufacturing sectors are concentrated in some states and contribute disproportionately because of out-of-state shipments that bring new money into the local economies. The findings in this report are critical to our understanding of the structure-conduct-performance issues affecting the green industry, as well as the economy at large. Participants in the green industry now have access to data to assist them in making strategic decisions regarding future investments in their respective businesses. In addition, policy makers have better information to inform their decisions regarding efficient allocation of resources (e.g., water and labor) among competing industries and interests.

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Introduction

The U.S. environmental horticulture industry, or green industry, is comprised of wholesale nursery, greenhouse, and turfgrass sod producers, landscape design, construction and maintenance firms, and wholesale and retail distribution firms such as garden centers, home stores, mass merchandisers with lawn/garden departments, brokers and re-wholesale distribution centers, and allied trades suppliers of inputs to the industry. The green industry has historically been a fast growing segment of the U.S. economy. However, the industry has reached the mature stage of its life cycle and is now growing slowly or even declining in some segments (Hall 2010). According to data from the Quarterly Census of Employment and Wages (U.S. Department of Labor 2018), employment in the principal sectors of the U.S. green industry reached a peak of 1.285 million jobs in 2007, then dropped sharply during the global recession of 2008-09. As of 2013, industry employment had somewhat recovered, but had not yet returned to pre-recession levels, but by 2018, employment had recovered fully and surpassed the 2007 employment levels. Over the 2007-18 period, total employment in the industry has increased by 2.75%, although this varied widely among specific industry sectors, with strong positive growth for landscaping services (+15.6%), but decreased for florists (-35.3%), landscape architectural services (-26.2%), lawn and garden equipment manufacturing (-8.8%), and nursery and floriculture production (-18.9%) (Fig. 1).

Employment for most sectors increased during 2001-07, then declined during the recession of 2007-09, and recovered during 2011-18, but 5 sectors remain below their 2007 peak level. The only industry sector showing steadily downward trending employment was florists, consistent with the decreasing number of brick-and-mortar

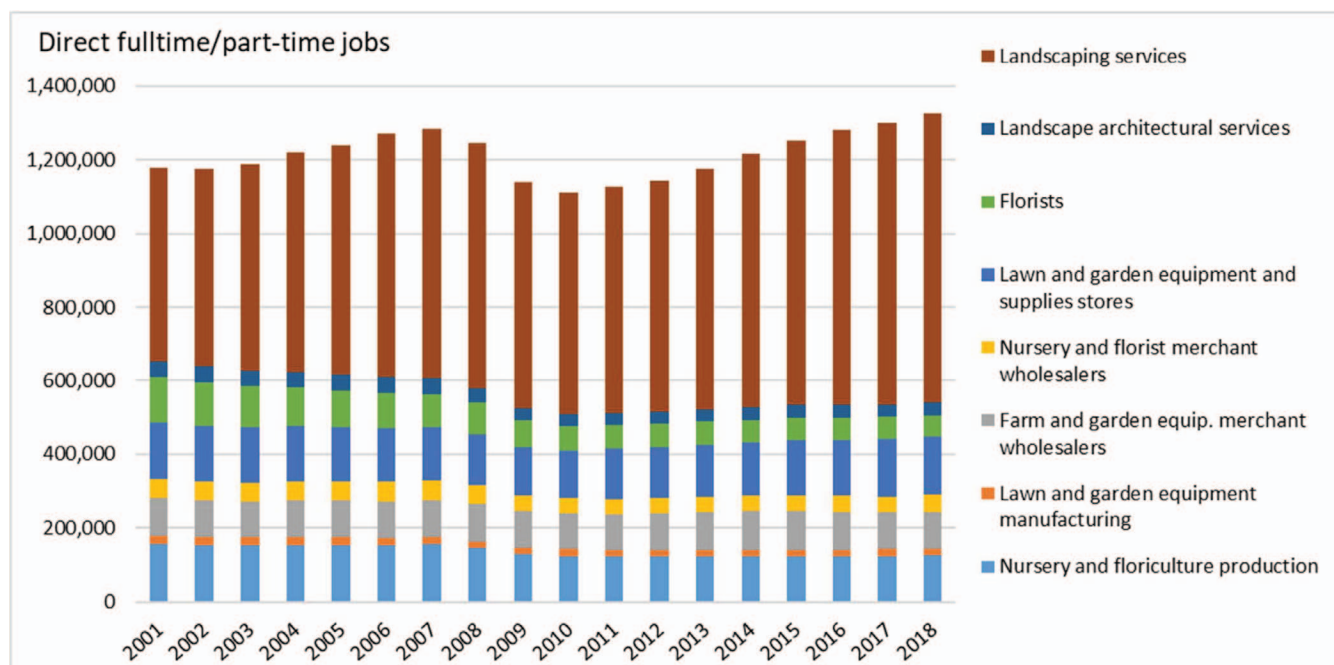


Fig. 1. Change in direct employment in primary sectors of the U.S. green industry during 2001-2018. Source: Annual data from the Quarterly Census of Employment and Wages (U.S. Bureau of Labor Statistics).

establishments. The number of business establishments in the green industry also declined during the recession, and has not recovered, in part due to consolidation and increasing concentration in the industry (Hall 2010). The housing sector collapse during the recession revealed that the rate of industry growth was unsustainable.

Recognizing the limitations of existing data sources and the critical need for economic impact information, numerous state nursery and landscape industry organizations have sponsored economic impact studies for their respective states. For example, studies were conducted in Florida (Hodges et al. 2011b, Hodges et al. 2017), Louisiana (Hinson et al. 2003) and Colorado (Thilmany et al. 2003). Stakeholders have found these studies to be useful in communicating the importance of the green industry to policy makers to gain assistance and resources, and in combating proposed legislation that would negatively impact the industry. However, direct comparison of these results across states is complicated because of differences in research methods utilized in these studies. For example, some states used mail, telephone or personal interview surveys to collect primary data, while others relied on secondary data sources. Another important difference is the number and type of sectors that were included in each respective study, with some states including end users such as households, golf courses and sports complexes, while others did not. Also, the regional economic models used to determine economic multipliers differed between studies. These factors point to the need to conduct a comprehensive national study that uses a common methodology to collect industry data and calculate associated economic contributions.

The first attempt to develop an internally consistent estimate of state and national economic contributions of the green industry was reported by Hall et al. (2006), with total

national economic contributions of the industry in 2002 given as 1.96 million fulltime and part-time jobs, \$147.8 billion (B) in industry output, and \$95.1 B in value added or GDP, expressed in 2004 dollars. A study conducted for 2007-08 reported total national contributions of the industry estimated at 1.95 million jobs, \$175.26 B in industry output, and \$107.16 billion in GDP (Hodges et al. 2011a). In a further study for 2013, the economic contributions of the industry were given as 1.60 million jobs, \$196.07 B in industry output, and \$120.71 B in GDP (Hodges et al., 2015). The largest individual industry sectors in 2013 in terms of employment and GDP contributions were landscaping services (1,105,526 jobs, \$54.70 B), nursery and greenhouse production (240,809 jobs, \$20.36 B), and lawn and garden equipment and supplies stores (217,798 jobs, \$12.87 B). The top ten individual states in terms of employment contributions were California (245,267 jobs), Florida (197,073), Texas (149,364), Ohio (77,664), Pennsylvania (77,569), Illinois (76,254), New York (73,676), North Carolina (72,014), Georgia (64,066), and Michigan (63,189). The green industry represented 0.72% of U.S. GDP and 1.11% of the total workforce in 2013.

The objective of this study was to update the previous estimates of the economic contributions of the green industry at the national and state levels by utilizing 2018 data. The findings from this study enables reliable comparisons among U.S. states and regions that will inform public policy and support efforts by industry stakeholders to communicate the importance of the green industry.

Materials and Methods

Economic sectors associated with the green industry were identified based on definitions in the North American

Table 1. Number of establishments, direct employment and wages in principal sectors of the U.S. green industry in 2018^z

Industry sector (NAICS code ^y)	Business establishments (no.)	Employees (no.)	Wages (million \$)
Landscaping services (56173)	108,664	785,727	28,874
Lawn and garden equipment and supplies stores (4442)	16,320	156,941	5,053
Nursery and floriculture production (11142)	7,210	125,218	4,209
Farm and garden equipment merchant wholesalers (423820)	8,810	100,908	5,951
Florists (4531)	12,665	59,273	1,268
Nursery and florist merchant wholesalers (42493)	3,404	45,057	1,747
Landscape architectural services (54132)	6,568	33,728	2,004
Lawn and garden equipment manufacturing (333112)	271	17,617	798
Total	<u>163,912</u>	<u>1,324,409</u>	<u>49,908</u>

^zSource: U.S. Department of Labor (2019), Quarterly census of employment and wages.

^yNumbers in parentheses are the code for each sector in the North American Industry Classification System.

Industry Classification System (NAICS, U.S. Department of Commerce 2018b). The production and manufacturing industry group includes the sectors for nursery, greenhouse and floriculture production (NAICS 11142) and lawn and garden equipment manufacturing (333112). The landscape design, construction and maintenance services industry group includes the sectors landscaping services (56173) and landscape architectural services (54132). The wholesale and retail distribution industry group includes farm and garden equipment merchant wholesalers (423820), nursery and florist merchant wholesalers (42493), lawn and garden equipment and supplies stores (4442), and florists (4531). These green industry sectors collectively had a total of 163,912 business establishments, with 1,324,409 direct employees, and \$49.91 B in wages paid in 2018 (Table 1). In addition, retail sectors that have significant sales of horticultural merchandise were included in the study.

Some retail sectors were not included in the analysis because the lawn and garden product sales were relatively minor and represented less than 1% of total sales: health and personal care stores, motor vehicle and parts dealers, sporting goods stores, furniture stores, electronics and appliance stores, and clothing stores. Specific lawn and garden product lines reported included outdoor nursery stock, indoor potted plants and floral items, cut flowers, fertilizer-lime-chemicals and other soil treatments, lawn and garden equipment and tools, materials used in landscaping or lawn service, and artificial/silk flowers plants-trees.

The regional economic contributions of green industry sectors were evaluated using the information on employment and wages in Table 1 together with economic multipliers from a U.S. model for 2017 created with the *IMPLAN* Input-Output/Social Accounting Matrix software (*IMPLAN* Group LLC 2018). These models represent the structure of a regional economy in terms of transactions between industries, employees, households, and government institutions (Miller and Blair 2009). Information in the model are derived from a variety of sources, including the Quarterly Census of Employment and Wages, state and national GDP and personal income statistics, the Economic Census and Census of Agriculture, which are considered very reliable sources, with a well-established methodology, adjustment for non-responding firms, and published statistical confidence parameters. The *IMPLAN* modeling system contains economic data for 536 industry sectors, including commodity production, employment, household income,

commodity trade, capital investment, taxes, transfer payments (e.g. welfare, retirement pensions), and gross margins for wholesale and retail trade sectors which represent the share of sales that constitute final demand after netting out cost of goods sold. *IMPLAN* multipliers capture the product or service sales (direct effects), supply chain purchases by industry firms from other economic sectors (indirect effects) and employee household consumer spending, and local, state and federal government spending (induced effects), with separate multipliers for industry output (sales revenues or receipts), employment, value added, and labor income (earnings). Differences in multiplier values reflect the structure of industry sectors, the degree of economic integration, and the mix of supplier industries available to meet local demands. The *IMPLAN* model was adjusted for multi-industry economic contribution analysis according to the method described by Cheney (2016). Note that this approach differs from previous published studies of the U.S. green industry, so the results are not strictly comparable, however, the updated model and approach were used to reanalyze results for a previous study for 2013 (Hodges et al, 2015) in order to make valid comparisons over time. The economic analysis results for the U.S. were allocated to individual states based on the share of direct employment within each industry sector. The state-level results were aggregated within eight agroclimatic regions of the U.S., as shown in Fig. 2, that are similar to farm production regions defined by the U.S. Department of Agriculture (2000). The results of economic contribution analysis represent the ongoing activity in the industry rather than a net change in economic activity (Watson et al. 2007).

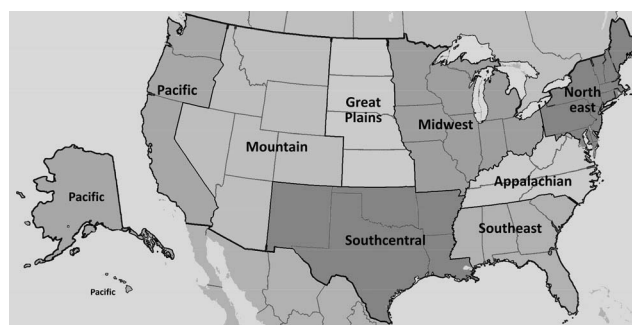


Fig. 2. Map of U.S. agroclimatic regions for economic contribution analysis of the green industry

Table 2. Summary of green industry economic contributions by industry sector in 2018.

Industry (NAICS)	Employment (Jobs)	Labor Income (M\$) ^z	Value Added ^y (M\$)	Output ^v (M\$)	State-local Taxes (M\$)	Federal Taxes (M\$)
Nursery and floriculture (11142)	217,574	10,705	15,943	28,690	744	2,207
Lawn and garden equipment manufacturing (333112)	68,108	4,175	7,532	22,149	449	966
Lawn and garden equipment, nursery and florist wholesalers (42382, 42493)	188,267	10,251	19,527	23,063	2,948	2,517
Retail garden stores (4442)	292,614	13,340	23,763	43,801	3,138	2,813
Florists (4531)	88,125	3,512	5,132	8,496	627	736
Landscape design and services (54132, 56173)	1,460,669	79,568	119,081	221,888	8,102	16,599
All Sectors	<u>2,315,357</u>	<u>121,549</u>	<u>190,977</u>	<u>348,087</u>	<u>16,008</u>	<u>25,837</u>

^zValues are given in millions of dollars. Employment represents fulltime and part-time jobs. Industry sectors defined by the North American Industry Classification System (NAICS).

^yIndustry output is equivalent to business sales. Labor income represents employee wages and benefits and business owner (proprietor) income. Value added is equivalent to Gross Domestic Product (GDP), including labor income, other property income (interest, rents, royalties, corporate profits) and business taxes. State-local and federal taxes represent all forms of taxation at prevailing average U.S. rates. Economic measures are independent and should not be added together.

^xResults are based upon annual data from the Quarterly Census of Employment and Wages (U.S. Bureau of Labor Statistics). Results include direct, indirect (supply chain) and induced (employee household spending) regional multiplier effects from the *IMPLAN* software (Implan Group, LLC) and the 2017 national trade flows model modified for economic contribution analysis.

Results and Discussion

The estimated total economic contributions of the U.S. green industry in 2018 are summarized by industry groups and sectors in Table 2 and Figures 3 and 4. Direct industry output or sales revenues for all sectors was \$159.57 billion (B). The total output contribution, including indirect and induced regional economic multiplier effects of exports, was \$348.08 B. Direct employment by green industry firms was 1,286,135 fulltime and part-time jobs, and the total employment contribution (including multiplier effects) in the broader economy was 2,315,357 jobs. The total value added, or GDP contribution was 190.98 B. The labor income contribution, representing employee compensation, benefits, and business owner income, was \$121.55 B, the property income contribution, representing rents, royalties, corporate dividends, capital gains, and interest, was \$16.01 B, and the contribution of \$25.84 B in business taxes on sales, property, payroll, excise, motor vehicle, fuels, etc. that were paid to local, state and federal governments.

By far the largest individual green industry sector was landscape services, with contributions of \$221.89 B in output, \$119.08 B in GDP value added, and 1,460,669 jobs (Table 2 and Figs. 3–5). The next largest industry sector was greenhouse, nursery and floriculture production, with \$28.69 B in output, \$15.94 B in GDP and 217,574 jobs. The largest retail sector was lawn and garden equipment and supplies stores, with contributions of \$43.80 B in output, \$23.76 B in GDP value added, and 292,614 jobs. Retail florists had contributions of \$8.49 B in output, \$5.13 B in GDP value added, and 88,125 jobs. Lawn and garden equipment and nursery and florist merchant wholesalers had contributions of \$23.06 B in output, \$19.53 B in GDP value added, and 188,267 jobs. Lastly, lawn and garden equipment manufacturing contributed \$22.15 B in output, \$7.53 B in GDP, and 68,108 jobs.

Economic contributions of the green industry in U.S. states and regions are summarized in Tables 3 and 4 and Figures 3 and 4. The largest regions in terms of employment contributions were the Midwest (465,263 jobs) and

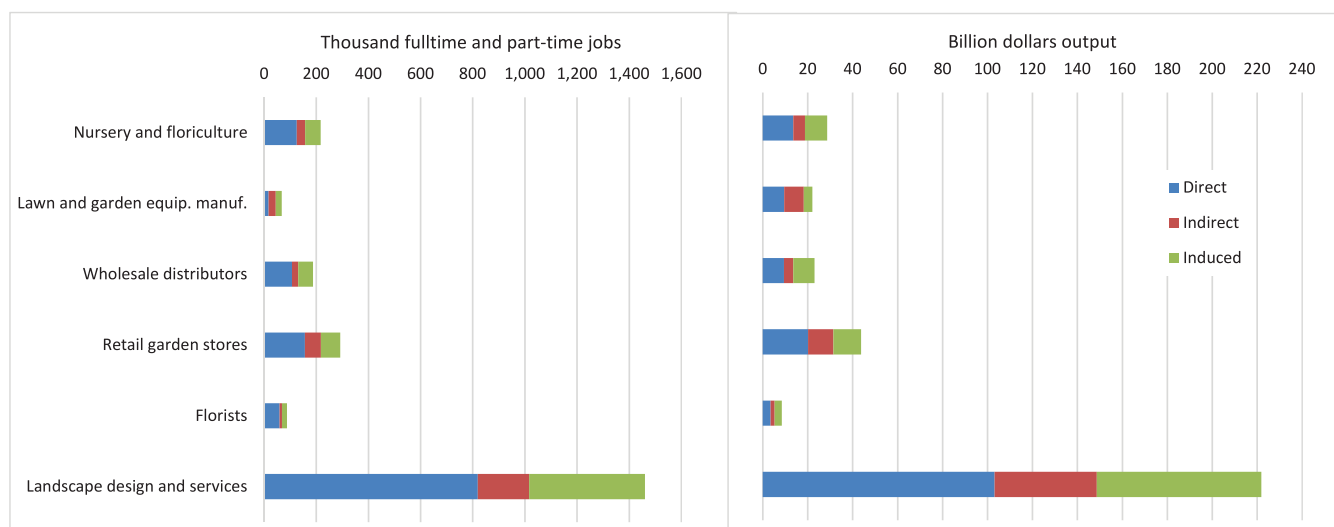


Fig. 3. Total employment and economic output impacts by green industry sector by direct, indirect, and induced impacts in 2018.

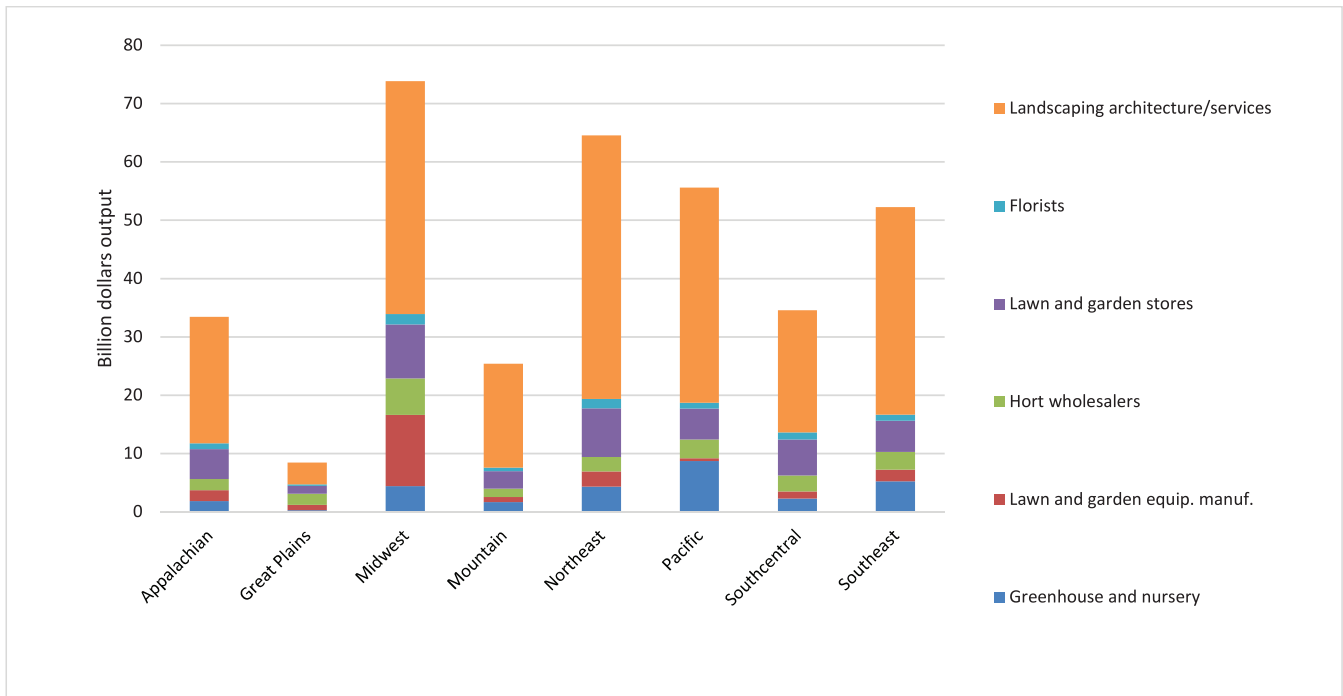


Fig. 4. Total economic output contributions by green industry sector by region in 2018.

Northeast (430,760), followed by the Pacific (382,355), Southeast (351,541), Southcentral (235,136), Appalachian (222,764), Mountain (170,620), and Great Plains (56,916). Industry output contributions were over \$73.8 B, \$64.5 B, and \$55.6 B in the Midwest, Northeast, and Pacific regions, respectively. The Southeast region had \$52.3 B in output, while the Southcentral and Appalachian regions had over \$34.6 B and \$33.4 B in output, respectively. The Mountain region had \$25.4 B in output and the Great Plains region had the lowest green industry contribution of \$8.5 B in output.

Among individual states, the top 10 states in terms of total employment and output contributions were California (264,913 jobs, \$38.6 B), Florida (203,482 jobs, \$29.8 B), Texas (161,151 jobs, \$23.6 B), Ohio (90,406 jobs, \$14.5 B), New York (90,266 jobs, \$13.6 B), Pennsylvania (90,075 jobs, \$13.1B), Illinois (87,595 jobs, \$13.9 B), North Carolina (78,766 jobs, \$11.9 B), Michigan (77,719 jobs, \$12.0 B), and Georgia (66,527 jobs, \$9.9 B) (Table 3). Other states with employment contributions exceeding 40,000 jobs and output contributions over \$6.2 B were New

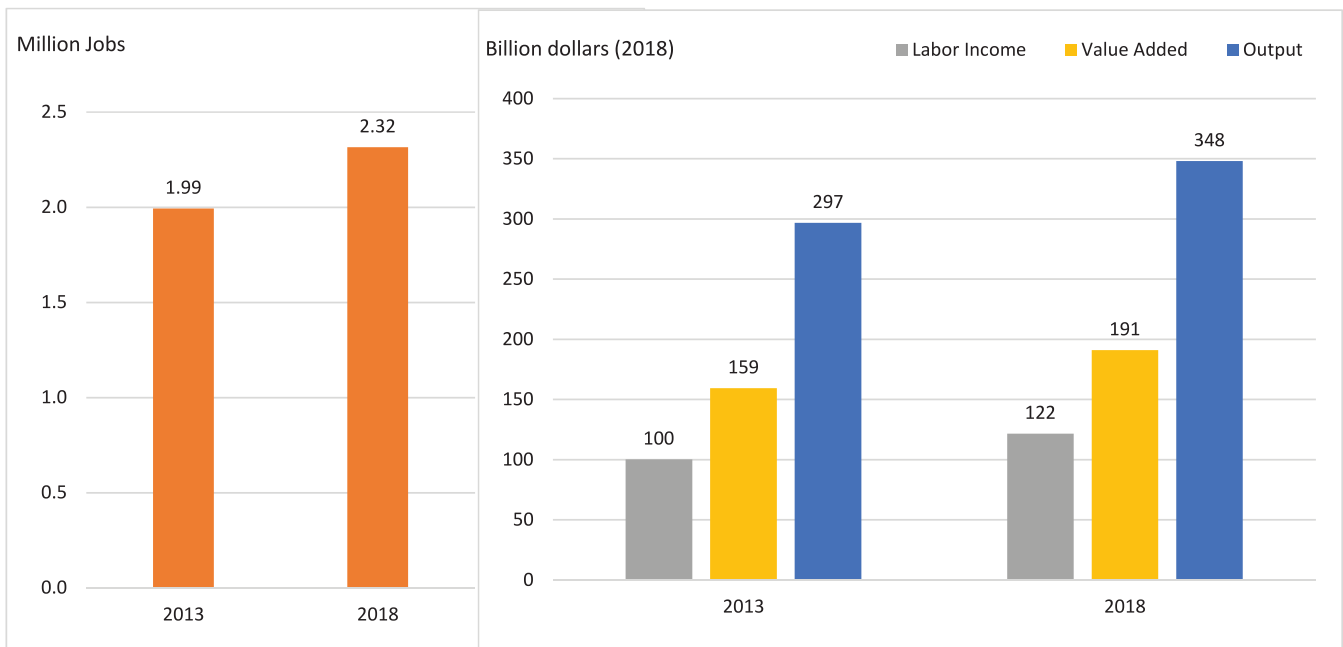


Fig. 5. Economic contribution estimates for 2018 compared with 2013 using the methodology for the 2018 study.

Table 3. Summary of green industry economic contributions by state in 2018.

State ^a	Employment by industry (fulltime, part-time jobs)							Labor income (M\$)	Value added (M\$)	Output (M\$)	State-local taxes (M\$)	Federal taxes (M\$)
	Nursery, floriculture	Equip. manuf.	Whole-sale	Retail	Florists	Landscape	Total					
Alabama	2,821	844	2,185	4,867	1,466	16,067	28,248	1,465	2,317	4,224	201	311
Alaska	731	0	98	229	69	1,727	2,853	149	227	412	17	31
Arizona	2,275	1,467	2,378	5,511	1,660	33,651	46,941	2,482	3,863	7,165	312	525
Arkansas	494	1,125	3,577	3,716	1,119	8,348	18,379	957	1,579	2,802	159	209
California	36,673	398	18,847	21,160	6,373	181,462	264,913	13,958	21,569	38,621	1,702	2,948
Colorado	3,498	563	3,088	5,064	1,525	34,834	48,571	2,564	3,979	7,219	322	542
Connecticut	2,725	563	984	4,213	1,269	21,630	31,384	1,643	2,543	4,702	203	346
Delaware	342	0	420	1,089	328	6,130	8,309	436	676	1,222	56	92
Dist. Columbia	146	0	13	143	43	1,469	1,814	96	146	270	11	20
Florida	30,169	1,013	12,236	12,349	3,719	143,997	203,482	10,768	16,550	29,888	1,259	2,270
Georgia	4,163	1,688	6,150	8,545	2,574	43,407	66,527	3,500	5,512	9,972	472	745
Hawaii	1,484	0	285	588	177	7,939	10,473	555	844	1,542	61	116
Idaho	830	30	2,664	2,240	674	8,952	15,391	804	1,291	2,206	123	173
Illinois	5,329	6,340	10,842	6,196	1,866	57,022	87,595	4,704	7,477	13,862	626	1,012
Indiana	1,947	1,398	5,030	7,544	2,272	27,510	45,701	2,388	3,807	6,855	344	511
Iowa	1,471	1,125	7,210	3,048	918	11,186	24,958	1,319	2,193	3,687	227	291
Kansas	801	844	4,555	3,105	935	12,117	22,358	1,178	1,919	3,334	187	256
Kentucky	729	52	3,040	5,624	1,694	14,994	26,134	1,345	2,152	3,768	206	287
Louisiana	1,295	563	2,285	5,326	1,604	11,534	22,607	1,158	1,860	3,338	176	247
Maine	1,286	281	517	1,906	574	8,178	12,743	664	1,034	1,907	84	140
Maryland	2,752	2,251	1,971	6,482	1,952	35,292	50,700	2,676	4,172	7,856	334	566
Massachusetts	2,212	563	1,449	5,675	1,709	41,305	52,913	2,799	4,302	7,941	336	588
Michigan	9,188	4,502	4,862	11,898	3,583	43,686	77,719	4,058	6,412	12,034	533	863
Minnesota	3,941	4,601	6,156	5,941	1,789	21,044	43,472	2,300	3,738	7,029	333	499
Mississippi	638	563	2,213	4,921	1,482	7,033	16,849	853	1,398	2,486	143	184
Missouri	1,906	563	5,220	8,456	2,547	24,097	42,788	2,212	3,543	6,246	334	473
Montana	661	0	1,618	1,182	356	4,827	8,644	452	726	1,230	70	98
Nebraska	691	1,125	5,408	2,562	771	7,428	17,985	950	1,594	2,706	169	211
Nevada	3,225	0	444	1,806	544	17,488	23,506	1,239	1,886	3,459	138	259
New Hampshire	725	0	401	2,398	722	9,209	13,455	697	1,082	1,972	91	146
New Jersey	4,133	1,407	4,415	5,645	1,700	47,214	64,513	3,427	5,323	9,724	427	726
New Mexico	971	0	757	1,510	455	5,360	9,052	468	736	1,305	64	99
New York	5,156	2,302	4,863	12,939	3,897	61,109	90,266	4,734	7,396	13,620	614	1,001
North Carolina	5,560	2,532	6,669	9,299	2,801	51,905	78,766	4,155	6,529	11,920	548	884
North Dakota	244	0	3,227	1,097	330	2,595	7,492	392	672	1,018	80	88
Ohio	6,598	7,760	5,855	13,043	3,928	53,222	90,406	4,769	7,576	14,527	628	1,018
Oklahoma	2,623	563	1,784	5,766	1,736	11,474	23,946	1,218	1,944	3,521	178	259
Oregon	13,531	281	2,998	4,803	1,447	20,018	43,078	2,213	3,440	6,142	268	467
Pennsylvania	12,451	480	4,502	12,701	3,825	56,116	90,075	4,675	7,261	13,144	591	985
Rhode Island	418	0	308	1,003	302	6,139	8,169	429	662	1,205	53	90
South Carolina	1,888	1,969	2,073	5,027	1,514	23,964	36,435	1,921	3,021	5,682	249	408
South Dakota	264	844	2,663	2,024	609	2,677	9,082	472	807	1,404	89	105
Tennessee	3,190	1,969	3,208	7,248	2,183	26,209	44,006	2,297	3,637	6,731	313	489
Texas	11,796	1,463	14,007	25,074	7,551	101,260	161,151	8,393	13,210	23,611	1,154	1,782
Utah	1,879	563	983	3,148	948	14,834	22,355	1,170	1,822	3,367	148	247
Vermont	247	281	379	1,316	396	3,798	6,417	333	528	983	47	71
Virginia	4,298	1,125	2,529	9,521	2,867	43,219	63,559	3,321	5,165	9,509	424	700
Washington	13,514	844	4,114	8,378	2,523	31,665	61,039	3,148	4,919	8,868	400	665
West Virginia	325	0	249	2,508	755	6,462	10,299	526	824	1,503	73	110
Wisconsin	2,996	11,261	6,043	5,604	1,688	25,033	52,625	2,853	4,686	9,602	390	623
Wyoming	345	0	498	1,180	355	2,833	5,212	266	424	748	40	57

^aNational estimates allocated to states in proportion to direct employment. Contributions include indirect and induced regional multiplier effects.

Jersey, Virginia, Washington, Massachusetts, Wisconsin, Maryland, Colorado, Arizona, Indiana, Tennessee, Minnesota, Oregon and Missouri. The top three states for value added, or GDP contributions were California (\$21.6 B), Florida (\$16.5 B), and Texas (\$13.2 B).

Since the previous study for 2013 (Hodges et al. 2015), the total economic contributions of the overall U.S. green industry in 2018 increased by 16.2% for employment, 17.3% for output, and 19.8% for GDP, with values adjusted for inflation using the GDP Implicit Price Deflator (U.S.

Commerce Department 2018a). Figure 5 presents economic contribution estimates that were also compiled for 2013 for comparison using similar, though not identical, sources and methods as for 2018.

During the 1980s and 1990s, the green industry was one of the fastest-growing sectors of the U.S. economy, due to robust demand for ornamental plants and related products and services from commercial and residential development and rising affluence. However, current trends and driving forces indicate that consumer demand is maturing, and

Table 4. Summary of green industry economic contributions by region in 2018.

Region ²	Employment by industry (fulltime, part-time jobs)							Labor income (M\$)	Value added (M\$)	Output (M\$)	State-local taxes (M\$)	Federal taxes (M\$)
	Nursery, floriculture	Equip. manuf.	Whole-sale	Retail	Florists	Landscape	Total					
Appalachian	14,102	5,679	15,694	34,200	10,300	142,791	222,764	11,644	18,307	33,432	1,563	2,471
Great Plains	2,000	2,813	15,853	8,787	2,646	24,817	56,916	2,992	4,993	8,461	524	661
Midwest	33,377	37,550	51,217	61,729	18,590	262,800	465,263	24,603	39,431	73,841	3,416	5,291
Mountain	12,713	2,623	11,673	20,131	6,063	117,418	170,620	8,977	13,993	25,394	1,154	1,901
Northeast	32,594	8,128	20,220	55,510	16,717	297,589	430,760	22,610	35,127	64,546	2,847	4,771
Pacific	65,932	1,524	26,341	35,159	10,588	242,811	382,355	20,023	30,999	55,585	2,447	4,228
Southcentral	17,178	3,714	22,411	41,392	12,466	137,976	235,136	12,193	19,330	34,576	1,732	2,596
Southeast	39,678	6,077	24,856	35,708	10,754	234,468	351,541	18,507	28,799	52,253	2,325	3,918
Total	<u>217,574</u>	<u>68,108</u>	<u>188,267</u>	<u>292,614</u>	<u>88,125</u>	<u>1,460,669</u>	<u>2,315,357</u>	<u>121,549</u>	<u>190,977</u>	<u>348,087</u>	<u>16,008</u>	<u>25,837</u>

²Regional results were aggregated from state-level results.

industry growth is slowing (Hall 2010). Obviously, the severe economic recession of 2008-09 placed a considerable financial strain on green industry businesses, as well as most other sectors of the global economy due to reduced home values and home ownership rates, and declining disposable household income in inflation-adjusted terms.

In spite of slowed growth or decreased activity in some sectors in recent years, the green industry remains an important contributor to the U.S. economy and to individual states and regions. The green industry is extremely broad based, with the landscape services and wholesale-retail trade sectors existing in virtually all communities in the nation. In contrast, the production and manufacturing sectors are concentrated in some states and contribute disproportionately because of out-of-state shipments that bring new money into the local economies.

These findings are critical to our understanding of the structure-conduct-performance issues affecting the green industry, as well as the economy at large. Participants in the green industry now have access to data to assist them in making strategic decisions regarding future investments in their respective businesses. In addition, policy makers have better information to inform their decisions regarding efficient allocation of resources (e.g., water and labor) among competing industries and interests.

Literature Cited

- Cheney, Phil. Multi-Industry Contribution Analysis in IMPLAN[®] Pro. IMPLAN[®] Group, LLC, 2016. <https://implanhelp.zendesk.com/hc/en-us/articles/115009542247-Multi-Industry-Contribution-Analysis-In-IMPLAN-Pro>. Accessed April 1, 2019.
- Hall, C.R. 2010. Making cents of green industry economics. *HortTechnology* 20(5):832–835.
- Hall, C.R., A.W. Hodges and J.J. Haydu. 2006. The economic impact of the green industry in the United States. *HortTechnology* 16(2):1–9.
- Hodges, A.W., C.R. Hall and M.A. Palma. 2011. Economic contributions of the green industry in the United States in 2007-08. *HortTechnology* 21(3): 628–638.
- Hodges, A.W., C.R. Hall, M.A. Palma and H. Khachatryan. 2015. Economic contributions of the green industry in the United States in 2013. *HortTechnology* 25(6): 805–814.
- Hodges, A.W., M.A. Palma and C.R. Hall. 2009. Trade flows and marketing practices within the U.S. nursery industry, 2008. *Southern Cooperative Series Bulletin* 411, 68 p. <http://aggie-horticulture.tamu.edu/faculty/hall/publications/scsb411.pdf>. Accessed Oct. 1, 2018.

Hodges, A.W., T.J. Stevens, M. Rahmani and H. Khachatryan. 2011b. Economic contributions of the Florida environmental horticulture industry in 2010. Report to the Florida Nursery Growers and Landscape Association. University of Florida, Food and Resource Economics Department, Gainesville, FL, 40 p. http://www.fred.ifas.ufl.edu/pdf/economic-impact-analysis/Economic_Contributions_Florida_Environmental_Horticulture_Industry_2010.pdf. Accessed Oct. 27, 2018.

Hodges, A.W., H. Khachatryan, M. Rahmani, and C. Court. 2017. Economic Survey of the Environmental Horticulture Industry in Florida in 2015. University of Florida, IFAS, Florida Cooperative Extension Service, Food and Resource Economics Department, Electronic Data Information Source Publication FE1031. 2 p.

Hinson, R.A., R. Pinel and D.W. Hughes. 2003. Louisiana's green industry: evaluation of its economic contribution. Research Information Sheet 108, Louisiana State University Agricultural Center, Baton Rouge, LA, 16 p. <https://www.lsuagcenter.com/NR/rdonlyres/BFEE68F0-DC32-4837-9AC1-A200BD57C973/4111/RIS108GreenIndustry6.pdf>. Accessed Oct. 27, 2018.

IMPLAN Group, LLC. 2018. *IMPLAN* impact analysis and social accounting software, and U.S. state and county data package for 2018, release 3, June 2018. Huntersville, NC.

Miller, R.E. and P. D. Blair. 2009. Input-output analysis: foundations and extensions. 2nd ed. Cambridge Univ. Press, New York, NY, 750 p.

Thilmany, D., P. Watson and S. Davies. 2003. The economic contribution of Colorado's green industry: revenue and employment trends. Final report to GreenCo, Colorado State University, Department of Agricultural and Resource Economics, 46 p. http://ghex.colostate.edu/pdf_files/greenco-final.pdf. Accessed Oct. 27, 2018.

U.S. Department of Agriculture. 2000. Farm resource regions. *Agricultural Information Bulletin* 760, 2 pages, Washington, D.C. http://www.ers.usda.gov/media/926929/aib-760_002.pdf. Accessed May 1, 2018.

U. S. Department of Commerce. 2009. 2007 Economic census, subject series, retail product line statistics for the U.S. and states, Census Bureau, Washington, D.C.

U.S. Department of Commerce. 2018a. U.S. Gross Domestic Product implicit price deflator, 1947 to present, quarterly, Bureau of Economic Analysis, Washington, D.C. <http://research.stlouisfed.org/fred2/data/gdpdef.txt>. Accessed Aug. 1, 2018.

U. S. Department of Commerce. 2018b. North American Industry Classification System lookup tool. Census Bureau Washington, D.C. <http://www.census.gov/eos/naics>. Accessed May 1, 2018.

U.S. Department of Labor. 2019. Quarterly census of employment and wages, data for all employees and all establishment sizes in selected industries, 2001-2018, Bureau of Labor Statistics, Washington, D.C. <http://www.bls.gov/cew>. Accessed May 1, 2019.

Watson, P., J. Wilson, D. Thilmany, and S. Winter. 2007. Determining economic contributions and impacts: what is the difference and why do we care? *Journal of Regional Analysis and Policy* 37(2):140–146. <http://www.jrap-journal.org/pastvolumes/2000/v37/F37-2-6.pdf>. Accessed May 1, 2018.