

BIOCYCLE WEST COAST18: ACCELERATING ORGANICS RECYCLING

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BIOCYCLE

THE ORGANICS RECYCLING AUTHORITY

**NATIONWIDE
BIOCYCLE SURVEY**

THE STATE OF ORGANICS RECYCLING

BioCycle, Official Magazine of the



US Composting
Council®

The State Of Organics

Total
composting facilities

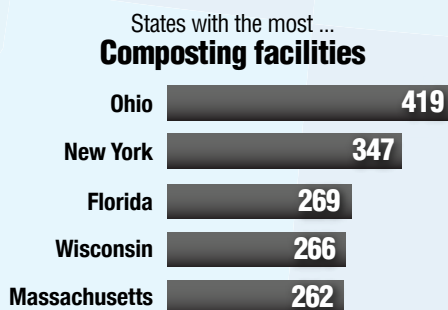
4,713

BioCycle asked states to complete an organics recycling "Snapshot Survey" to collect most recent data on composting, anaerobic digestion and quantities of organics diverted.

Nora Goldstein

FROM December 2016 to June 2017, *BioCycle* editors collected the most recent data that states had compiled about organics recycling activities. A one-page questionnaire was completed by 43 states and the District of Columbia, primarily by officials in state solid waste agencies whose responsibilities include organics recycling. Data submitted was primarily from Calendar Years 2015-2017.

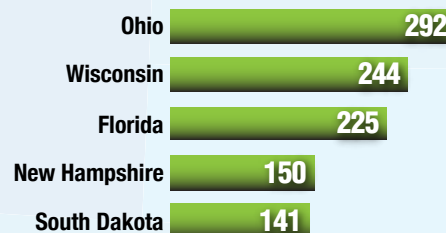
The 2017 *State of Organics Recycling In The U.S.* survey requested information on both composting and anaerobic digestion infrastructure and regulations. While several solid waste agency officials who responded had data on anaerobic digestion activity in their state, the majority did not, as mu-



nicipal and on-farm anaerobic digestion operations typically fall under the purview of other state agencies. As a result, *BioCycle* utilized other sources to collect much of the data on anaerobic digestion.

BioCycle considers the data collection process used for this 2017 report as a "State Snapshot Survey" — essentially a snapshot in time of information available from states on organics recycling activities. It became evident in the course of conducting the 2017 *State of Organics Recycling In The U.S.* that fewer states have data available on composting since *BioCycle* conducted a similar survey in 2013 as part of the 2014 *State of Composting*

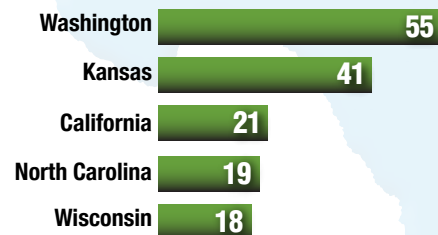
States with the most ...
Yard trimmings composting sites



In The U.S. project, led by the Institute for Local Self-Reliance (see summary in "State Of Composting In The U.S.," July 2014). For example, in some states, yard trimmings composting operations are exempt from filing annual reports with the solid waste agencies, thus no aggregated data is available for that category of composting facilities at the state level. Other states don't have adequate staff to compile data that may be submitted via annual reporting requirements.

Seven states did not respond to the "BioCycle Survey of State Organics Recycling Activity" questionnaire: Hawaii, Illinois, Indiana, New Jersey, Pennsylvania, Utah and West Virginia. However, *BioCycle* was able to utilize in-house data as well as obtain composting data for Illinois (from members of the Illinois Food Scrap Coalition), Indiana (from a mapping project done by

States with the most ...
Yard trimmings & food waste composting sites



Recycling In The U.S.

the Indiana Recycling Coalition of both composting and AD infrastructure) and Pennsylvania (through a District of office of the state's Department of Environmental Protection). Four states returned the questionnaires, but only had minimal data to report. These include Alabama, Arizona, Iowa and Missouri.

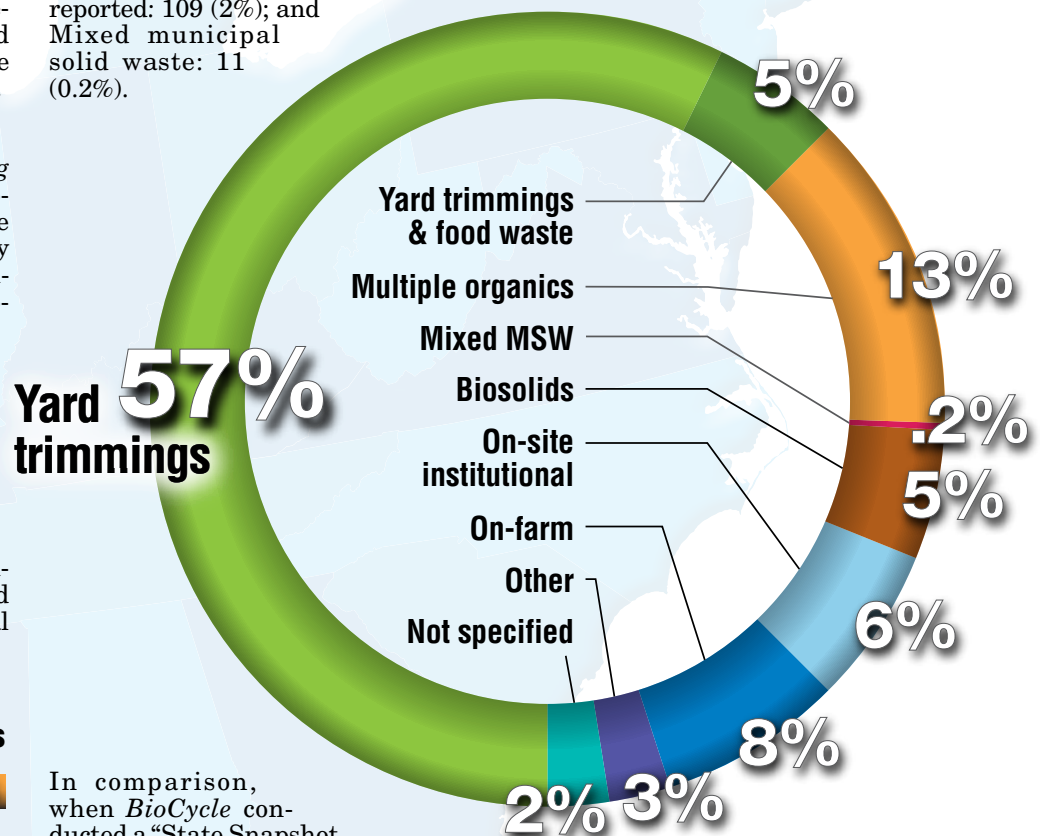
THE BIG PICTURE

The 2017 *State of Organics Recycling In The U.S.* snapshot survey found a total of 4,713 composting facilities. Table 1 summarizes this total number by facility types. Figure 1 is a representation of this data by percentage of total facilities (4,713). The state-by-state composting data is in Table 2.

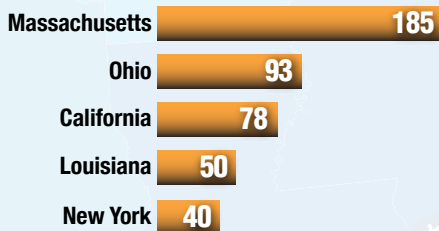
Yard trimmings composting comprises the largest number of operations — 2,698 or 57 percent of all facilities in the U.S. There are 249 composting sites that process yard trimmings and food scraps only (5%), and 620 (13%) that process multiple organics, which include feedstocks such as yard trimmings, food scraps, livestock manure and industrial

(5%); Other, e.g., wood, food processing, mortalities: 126 (5%); Not specified, i.e., only total number of facilities in all categories reported: 109 (2%); and Mixed municipal solid waste: 11 (0.2%).

Composting facilities by type



States with the most ... Multiple organics composting sites

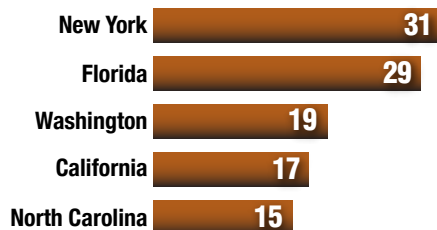


organics. Massachusetts, for example, reports 185 composting facilities processing multiple organics and did not include any sites in the yard trimmings only or yard trimmings and food scraps only categories. Percentage breakdown of the remaining facility types is as follows: On-farm: 354 (8%); On-Site Institutional: 297 (6%); Biosolids: 249

In comparison, when *BioCycle* conducted a "State Snapshot Survey" on composting infrastructure in the U.S. in 2013 (to collect data for the 2014 *State of Composting in the U.S.*), a total of 4,914 composting operations in the U.S. were reported — 201 more than are reported in 2017. The following is a brief analysis.

Yard Trimmings Composting: There is a decrease of 755 in the total number of yard trimmings sites (from 3,453 in 2014 to 2,698 in 2017). Some state data is significantly different between the reporting years (2013 vs. 2017), e.g., Pennsylvania: 350 vs. 158; New York: 329 vs. 133; and Massachusetts: 221 vs. 0 (an explanation is in the State Officials' Insights section). How states

States with the most ...
Biosolids composting sites



categorize yard trimmings composting sites in terms of permitting is discussed as well in the State Officials' Insights section.

Food Waste Composting: In the 2013 "State Snapshot Survey," *BioCycle* requested facility information for both source separated food waste composting and mixed organics composting. The latter category was defined as facilities handling multiple organics streams beyond yard trimmings and food waste. The term "mixed organics" was confused with "mixed waste" by some states. In an attempt to clarify the terminology, in the "BioCycle Survey of State Organics Recycling Activity" questionnaire initially emailed to states in December 2016, *BioCycle*

Table 1. Composting facilities in the U.S. (data reported, 2015-2017)

Composting Facility Types	Total of Each Type	Percent of Total
All composting facilities	4,713	
Yard trimmings	2,698	57.2
Yard trimming + food scraps	249	5.3
Multiple organics ¹	620	13.2
Mixed MSW	11	0.23
Biosolids	249	5.3
On-Site Institutional	297 ²	6.3
On-Farm	354 ²	7.5
Other ³	126	2.7
Not specified ⁴	109	2.3

¹Taking more than yard trimmings and/or food scraps, e.g., yard trimmings, food, manure, wood shavings, industrial organics, etc.; ²Typically exempt from permitting or permit-by-rule thus often undercounted; ³Includes sites that compost mortalities, animal by-products, community composting sites, seafood processing residuals, etc.; ⁴Two states only provided a total number of composting facilities, and no break down by categories.

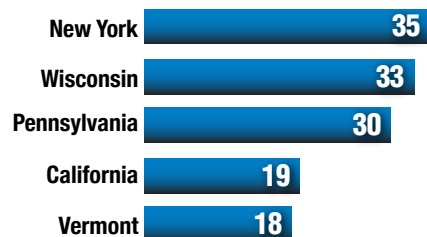
requested a breakdown of infrastructure as follows: Yard trimmings only; Yard trimming + food waste only; and Multiple organics, defined as facilities composting more than yard trimmings or yard trimmings and food waste only. The differences between the data reported (2014 "State of Composting" vs. 2017 "State of Organics Recycling") are interesting:

- 2014: Source separated food waste is 347 and mixed organics is 87.
- 2017: Yard trimming + food waste is 249 and multiple organics is 620.

BioCycle followed up with state officials about the facilities being included in the multiple organics category. The primary question was: How many of the multiple organics facilities in your state are taking food waste? In the state of Montana, the answer was none. In Massachusetts, it included a portion, but not enough data was available to provide a full explanation. California, on the other hand, reported 21 composting facilities processing yard trimmings and food waste only, and 78 processing multiple organics. In this case, it is likely that food waste is included in a number of the multiple organics composting facilities' stream. *BioCycle* will be examining this data in more detail over the next few months.

Table 3 lists the state-by-state data on anaerobic digestion facilities in the following categories, with totals provided for each category: Livestock manure only—146; Livestock manure codigested with food waste and other high strength organics (HSOs)—94; Biosolids codigested with food waste and other HSOs at wastewater treatment plants (WWTPs)—133; Food only digesters—18; Digesters processing multiple organics, e.g., food waste, yard trimmings, industrial organics—7. The Water Environment Federation (WEF), in collaboration with the American Biogas Council (ABC), tracks the number of an-

States with the most ...
Livestock manure digesters



aerobic digesters installed at wastewater treatment plants for biosolids (which WEF references as water resource recovery facilities (WRRFs)). Newly released findings, courtesy of WEF-ABC, are 1,269 anaerobic digesters treating biosolids at WRRFs, of which 860 utilize the biogas being generated.

BioCycle obtained information for biosolids codigestion from the Water Environment & Reuse Foundation (WE&RF) and the California Association of Sanitation Agencies (CASA), along with biosolids codigestion data from several states. WE&RF, CASA and *BioCycle* concur that there are likely more than 133 treatment plants receiving off-site organic substrates for codigestion at WWTPs. Data from WEF-ABC illustrate this point: 14 percent of the 1,269 WRRFs with AD — 177 — accept additional organics from off-site generators.

COMPOSTING METHODS AND SCALE

Thirty-four states reported data on composting methods utilized by facilities in their states (Table 4). The results: Windrows—1,135; Static piles—409; Aerated static piles—170; and In-Vessel—81. The composting methods question was not asked on the "State of Composting" questionnaire, therefore no comparable data exists between the 2014 and 2017 reports.



Table 2. Composting facilities in the U.S., total, and by feedstock (data reported, 2015-2017)

State	Total Composting Facilities	Yard Trimmings Only	Yard & Food Waste	Multiple ¹ Organics	MSW	Biosolids	On-Site, ² Institutional	On-Farm ²	Other
Alabama	n/a	0 ³	n/a	n/a	n/a	n/a	n/a ⁴	n/a	n/a
Alaska	5	n/a	n/a	n/a	2	2	1	n/a	
Arizona ⁵	6	2	1	2		1		n/a	n/a
Arkansas	27	16		5		4 ⁶	2		
California	249	39	21	78	2	17	73	19	
Colorado	33	1	2	7	0	8	5	10	
Connecticut	140	109 ⁷	4			1	n/a	26 ⁸	
Delaware	5	2	0	2	0	1			
District of Columbia	63						13		>50 ⁹
Florida	269	225	n/a	11	1	29	n/a	n/a	3 ¹⁰
Georgia	42	1 ¹¹	n/a	n/a	n/a	5	14	21	1 ¹²
Hawaii	2					2 ⁶			
Idaho	5			3		2			
Illinois	58	47	10 ¹³			1			
Indiana	119	110 ¹⁴	9 ¹⁴						
Iowa	80								
Kansas	184	116	41					19	8 ¹⁵
Kentucky	33	23	1	2	0	4	3	n/a	
Louisiana	215	60 ¹⁶		50			5	50	50 ¹⁷
Maine	121	80	0	15		14	2	10	
Maryland	18	14	3	1	n/a	n/a			
Massachusetts	262	n/a		185	2	9	4	62	
Michigan	114	102	9	1		2 ⁶			
Minnesota	129	115		9			5		
Mississippi	15	10	4	1					
Missouri	11	6 ⁵	3 ⁵			2			
Montana	45	24	0	10 ¹⁸	1	1	0	2	7 ¹⁹
Nebraska	10	2 ²⁰		2	0	5		1	
Nevada	10	1	0	6	0	1	1	1	
New Hampshire	162	150	2	6		4 ⁶			
New Jersey	301	295 ²¹		1		5			
New Mexico	41	4	2	14	0	10	1	4	6 ²²
New York	347	133	12	40	1	31	97	33	
N. Carolina	64	22	19	2		15	6		
N. Dakota	81	69	0	9	0	0	1	2	
Ohio	419	292	n/a	93	0	3	11	20 ²³	
Oklahoma	14	5		3		6			
Oregon	60	16	6	20	0	6	n/a	12 ²⁴	
Pennsylvania	217	158	16			9 ⁶	21	13	
Rhode Island	24	21	0	1	0	1		1	
S. Carolina	23	3 ²⁵	4	1			15		
S. Dakota	143	141	0	1	1				
Tennessee	8	4	2	1	1				
Texas	34	4		20		10 ⁶			
Utah	37	18 ²¹	4 ²¹			15 ⁶			
Vermont	14	1	0	9	0			3	1 ¹⁵
Virginia	33	8	1	4	0	3	9	8	
Washington	126	5	55	2		19	8	37	
W. Virginia									
Wisconsin	266	244	18	3	0	1			
Wyoming	29								
Total	4,713	2,698	249	620	11	249	297	354	126

¹Taking more than yard trimmings and/or food scraps, e.g., yard trimmings, food, manure, wood shavings, industrial organics, etc; ²Typically exempt from permitting or permit-by-rule thus often under counted; ³Yard trimmings are only processed into mulch. No composting; ⁴Food waste is only diverted by universities who use it on site; ⁵BioCycle estimates; ⁶Source: "Biosolids Composting In The United States — 2010 Update," BioCycle, Vol. 51, No. 12, 35-41; ⁷Leaves only; ⁸Conn. DEEP estimate; ⁹Community composting sites; ¹⁰Animal by-products; ¹¹Georgia EPD does not track yard trimmings composting; ¹²Industrial sludges, ash, bark; ¹³Source: Illinois Food Scrap Coalition; ¹⁴Source: Indiana Recycling Coalition; ¹⁵Mortalities; ¹⁶Estimate of 60 yard trimmings composters by Louisiana Dept. of Agriculture & Forestry, with estimated 240 sites making mulch; ¹⁷Food processing residuals; ¹⁸Manure is primary feedstock. No multiple organics sites taking food waste; ¹⁹Road kill; ²⁰Nebraska DEQ estimate; ²¹Source: "State of Composting In The U.S.," 2014, Inst. for Local Self-Reliance; ²²Offal; ²³20 on-farm facilities do not meet exemption and are registered (permitted). Many others are exempt; ²⁴Oregon DEQ estimate; ²⁵94 yard trimmings mulch only sites.

Table 3. Anaerobic digestion facilities in the U.S., by feedstock (2015-2017)

State	Manure Only ¹	Manure + Food Codigestion ¹	Biosolids Codigestion ^{2,3}	Food Only	Multiple Organics
Alabama			2		
Alaska					
Arizona	2		1		
Arkansas	1		1		
California	13	6	42 ⁴	4	4
Colorado	1		3		
Connecticut	1 ⁵		1	1	
Delaware					
District of Columbia					
Florida	2		3		
Georgia	1		2		
Hawaii					
Idaho	5	1	1		
Illinois	2	1	5		
Indiana	7	2			
Iowa	1	3	2		
Kansas		1	1		
Kentucky		1 ⁶			
Louisiana					
Maine		1 ⁷	1		
Maryland	1				
Massachusetts		3 ⁸	2	3	
Michigan	7 ⁹	2 ⁹	2		1
Minnesota	5	2	2		
Mississippi	4				
Missouri	2	1	1		
Montana	1				
Nebraska	1		1		
Nevada			1		
New Hampshire			1		
New Jersey			3		
New Mexico					
New York	20	15	11	4	
N. Carolina	7	3			
N. Dakota					
Ohio	3 ¹⁰	1 ¹⁰	13 ¹⁰	3	
Oklahoma	1				
Oregon	4 ¹¹	3 ¹¹	5	2	
Pennsylvania	12	18	3		
Rhode Island					1
S. Carolina	2				
S. Dakota	1				
Tennessee					
Texas	2		3		
Utah	4				
Vermont	7	11	3		
Virginia	1 ¹²		2		
Washington	2 ¹³	7 ¹³		1	
W. Virginia			1		
Wisconsin	21 ¹⁴	12 ¹⁴	14	0	1
Wyoming		2			
Total	146	94	133	18	7

¹BioCycle utilized livestock manure facilities data from USEPA AgSTAR, Livestock Anaerobic Digester Project Database, Aug. 2017, unless noted; ²BioCycle utilized 2016 codigestion data compiled by the Water Environment & Reuse Foundation for all states excepting California and Ohio; ³Water Environment Federation's www.resource recoverydata.org lists water resource recovery facilities with operating anaerobic digestion, on-site, or sending biosolids to AD; ⁴2017 Estimate supplied by California Association of Sanitation Agencies; ⁵Source: Conn. DEEP; ⁶Source: Kentucky DEP; ⁷Source: Maine DEP; ⁸Source: Mass. DEP; ⁹Source: Mich. DEQ; ¹⁰Source: Ohio EPA; ¹¹Source: Oregon DEQ; ¹²Source: Virginia DEQ; ¹³Source: Washington DOE; ¹⁴Source: Wisconsin DNR.

Thirty-eight states estimated the number of composting facilities by annual throughput (Table 5). Similar to the 2014 *State of Composting In The U.S.*, the vast majority of composting facilities — 2,364 — compost less than 5,000 tons/year (tpy) of feedstocks. There are 429 sites composting 5,000 to <30,000 tpy, and 194 facilities compost over 30,000 tpy of material.

The tons/year ranges were modified on the “State Snapshot Survey” sent in December 2016 for the medium-scale and large-scale operations from 5,000 to <20,000 and >20,000 respectively (2013 “Snapshot Survey”) to 5,000 to <30,000 and >30,000 respectively (2016 “Snapshot Survey”). A comparison of the totals follows:

- Small-scale composters (<5,000 tpy): 2,354 (2014) vs. 2,364 (2017), a minor increase.

- Mid-scale composters: 713 (5,000 to <20,000 tpy, 2014) vs. 429 (5,000 to <30,000 tpy 2017), a decrease of 60 percent.

- Large-scale composters: 218 (>20,000 tpy, 2014) vs. 194 (>30,000

Table 4. Composting facilities, by method

State	Windrow	SP ¹	ASP ²	I-V ³
Alaska	0	0	4	1
Arizona	5		1	
Arkansas	8	10		
California	151	0	12	13
Colorado	23	8	1	1
Delaware	1	1	3	0
Georgia	11	10	1	5
Idaho	3		2	
Iowa	25	6	48	1
Kansas	165	21		
Kentucky	33			
Louisiana	150	15	25	25
Maine	25	80	11	3
Maryland	16		2	
Minnesota	5	0	4	2
Mississippi	3	8		
Montana	13	27	1	1
Nebraska	8			
Nevada	5		1	
New Mexico	20	19	1	1
N. Carolina	14	2	4	2
N. Dakota	23	57	0	0
Ohio				10
Oklahoma	13		1	1
Oregon	32	13	8	0
Rhode Island	22	1		1
S. Carolina	7		1	
S. Dakota	16	126	0	1
Tennessee	7	0	1	
Texas	15	1	2	
Vermont	9	0	1	0
Virginia	18	0	4	5
Washington	24	4	30	8
Wisconsin	265	0	1	
Total	1,135	409	170	81

34 states reporting.

¹Static pile; ²Aerated static pile; ³In-Vessel.

tpy), therefore a slight increase in the total number.

One final note on The Big Picture. As discussed in the October 2017 *BioCycle* Editorial, “Digging For Data,” our analysis of the 2017 *State of Organics Recycling in the U.S.* findings highlights the importance of creating and utilizing a standard set of definitions when requesting data. For example, some states include mulch operations in their yard trimmings composting count. Responses to the multiple organics feedstock category are another example. *BioCycle* editors plan to collaborate with state organics recycling officials and stakeholder groups about standardizing definitions and helping to facilitate organics recycling data collection and reporting.

Table 5. Composting facilities by annual throughput (tons/year)

State	<5,000	5,000- <30,000	30,000+
Alaska	2		
Arizona	3		3
Arkansas	12	4	2
California	47	73	56
Colorado	24	7	2
Connecticut	82	46	12
Delaware	2	2	1
District of Columbia	63		
Florida	212	43	30
Georgia	3		1 ¹
Idaho	0	5	0
Kansas	178	5	1
Kentucky	28	5	
Maine	111	7	1
Maryland	8	6	4
Michigan	64	26	18
Minnesota	1	8	1
Mississippi	9	2	
Montana	43	2	0
Nebraska	n/a	4	6
Nevada	2	2	3
New Hampshire	153	3	
New Mexico	35	6	0
New York	287	43	17
N. Carolina	27	16	8
N. Dakota	81	0	0
Ohio	356	45	3
Oregon	20 ²	13	9
Rhode Island	16	7	1
S. Dakota	141	2	0
Tennessee	6	1	1
Vermont	7	4	1
Virginia	26	6	2
Washington	38	18	11
Wisconsin	252	14	0
Wyoming	25	4	0
Total	2,364	429	194

36 states reporting.

¹Permit pending; ²20 permitted. Many permit-exempt facilities under 5,000 tons/year.

TONS DIVERTED

Thirty-five states reported data on the tons of organics recycled via composting and anaerobic digestion, primarily using 2015 and 2016 data (Table 6). Only a handful of states had quantities for all of the categories requested: yard trimmings, food waste, biosolids, livestock manure and other. The 35 states reported a total of 21.1 million tons of organics diverted. Yard trimmings comprise the greatest tonnage (14.4 million tpy), followed by Food waste (1.8 million tpy), Other (1.7 million tpy), Biosolids (1.6 million tpy), and Livestock manure (1.57 million tpy). Materials included in the other category are identified in the Table 6 footnotes.

Thirty-one states reported data on tons diverted to composting, utilizing

2014-2016 data (Table 7). Total quantity diverted to composting by these states is 14.0 million tpy.

PROGRAMS TO SUPPORT COMPOSTING, AD

Financing, technical assistance and training, and disposal bans and diversion mandates are pretty much under the purview of state legislatures and state organics recycling agencies, versus the federal government. Limited financing is available from the U.S. Department of Agriculture, e.g., the EQIP program for on-farm composting and the REAP (Rural Energy for America Program) for grants and loan guarantees to farms for livestock manure digesters. The U.S. EPA regional offices may offer grants, typically in

Table 6. Organics recycled via composting and anaerobic digestion, by feedstock type (tons/year, 2015-2016 data primarily)

State	Yard trimmings	Food Waste	Biosolids	Manure	Other
Alabama	27,757				
Alaska	n/a	65		1,800	
Arkansas	49,786	1,322	27,063		
California	4,055,000	500,000	450,000	600,000	150,000 ¹
Colorado	158,368	98,879	34,971	337,983	
Connecticut	291,541	5,954	350	1,738	
Delaware	24,017	0	1,200	0	
Florida	2,674,143	221,773	239,500	264,512	192,772 ²
Georgia	1,331	468	22,352		20,444 ³
Iowa	143,113	16,633	26,445	13,379	97,063 ⁴
Kansas	88,998			3,152	82,137 ⁵
Kentucky	133,963				
Louisiana	250,000	50		40,000	50,050 ⁶
Maine	16,450	3,400	55,000 (wet)	31,000	6,225 ⁷
Maryland	640,541	80,263			174,440 ⁸
Massachusetts		270,000			
Michigan	1,568,500	29,800		11,100	
Minnesota	161,362	52,359			
Montana	34,156		2,090	601	570 ⁹
Nebraska	150,000	24,000	6,860		
Nevada	18,839	34,432	13,323		
New Mexico	28,900	4,400	9,600	11,900	4,100 ¹⁰
New York	440,000	20,000	550,000	n/a	
N. Carolina	430,000	46,613	80,000	52,270	
N. Dakota	30,040	0	0	445	
Ohio	735,666	74,807	n/a	120,017	
Oregon	520,378	55,000			378,465 ¹¹
Rhode Island	72,825		2,600		
S. Carolina	379,694	10,157			
S. Dakota	49,831		6,337		8,775 ¹²
Texas	441,908				
Vermont	16,687	6,566		4,816	8,285 ¹³
Virginia	153,598		76,100 (wet)		49,844 ¹⁴
Washington	325,702	263,170	10,836	80,796	513,853 ¹⁵
Wisconsin	257,915	13,471			
Total by type	14,371,009	1,833,582	1,615,927	1,575,509	1,737,023
Grand total for all feedstock types: 21,133,050					

35 states reporting.

¹Wood; ²Not specified; ³Wood, mortalities, ash; ⁴Wood, industrial sludge, paper, mortalities, crops; ⁵81,157 tons=source separated organics, 980 tons=mortalities; ⁶Seafood processing, fats, oils, grease (FOG); ⁷Seafood processing; ⁸Bark, chicken litter, manure, wood, etc; ⁹Offal, road kill; ¹⁰Offal, FOG, mortalities, paper; ¹¹Wood waste; ¹²Mixed MSW; ¹³Offal, oil, grease, high carbon burlap, vegetation; ¹⁴Industrial food waste, biosolids, manure, etc; ¹⁵Other agricultural and industrial organics, mortalities, sawdust, paper, wood, etc.

Table 7. Tons to composting, by state (data reported, 2014-2016)

State	Tons Composted
Arkansas	95,081
California	5,600,000
Colorado	257,678
Connecticut	299,234
Delaware	25,217
District of Columbia	7,389
Illinois ¹	511,171
Iowa	297,044
Kansas	174,287
Maine ²	23,627
Maryland	825,103
Michigan	784,250
Minnesota	213,499
Mississippi	26,296
Montana	86,553
Nebraska	375,440
Nevada	164,839
New Mexico	59,000
New York	460,000
N. Carolina ³	663,165
N. Dakota	23,535
Ohio	465,245
Oregon	481,518
Rhode Island	75,425
S. Carolina	126,470
S. Dakota	49,831
Texas	302,567
Vermont	49,934
Virginia	49,844
Washington	1,167,011
Wisconsin	300,688
Total	14,040,941

31 states reporting.

¹2014 data; ²MSW organics only; ³Includes all materials accepted at NCDEQ Div. of Waste Mngt. Solid Waste Section composting facilities. However, includes 63,317 tons of biosolids (not all of biosolids composted in N. Carolina).

the \$5,000 to \$25,000 range, for food waste reduction initiatives. In terms of education and outreach about organics recycling, both the U.S. EPA and USDA have ongoing programs, e.g., EPA's Food Recovery Challenge, Wastewise, AgSTAR and EPA's anaerobic digestion webpage (epa.gov/anaerobic-digestion), and USDA's Bio-gas Opportunities Roadmap.

The *State of Organics Recycling In The U.S.* questionnaire asked states to provide an update on their programs and policies to support composting and anaerobic digestion (Table 8). Forty-five states and the District of Columbia responded to these questions. Response totals are summarized as follows: Grants—20; Loans—9; Tax incentives—8; Technical assistance—30; Organics diversion mandates—7; Yard trimmings disposal ban—21; Food waste disposal ban—4; Outreach and education—32; Operator training courses—19.

California leads the nation in financial assistance for composting and anaerobic digestion infrastructure via California Climate Investments, a statewide program that puts billions of the state's Cap-and-Trade auction proceeds toward reducing greenhouse gas emissions, strengthening the economy and improving public health and the environment — particularly in disadvantaged communities. Auction proceeds are deposited in the Greenhouse Gas Reduction Fund (GGRF). Competitive grant programs utilizing GGRF monies for food waste reduction and recycling are administered by the California Department of Resources Recycling and Recovery (CalRecycle) under its Organics Grant Program. The purpose of this competitive grant program is to lower overall greenhouse gas emissions by expanding existing capacity or establishing new facilities in California to reduce the amount of California-generated green materials, food materials, or alternative daily cover being sent to landfills. In FY 2016-17, \$12 million was made available for composting projects, \$12 million for anaerobic digestion projects and \$5 million for new or expanding existing food waste prevention projects.

STATE RANKINGS

Rankings of states' composting and anaerobic digestion infrastructure are provided in Tables 9-14. *BioCycle* included New Jersey's data from the 2014 *State of Composting In The U.S.* in Tables 9 and 10 because, based on "State of Composting" data, the state comprises 6.4 percent of the national composting infrastructure. *BioCycle* spoke with several state officials in the New Jersey Department of Environmental Protection in an attempt to gather more recent composting infrastructure data. One official noted that a significant cut in the Department's staffing precludes its ability to tabulate any infrastructure data and tonnages of organics recycled.

Rankings are provided in the following categories: Total composting facilities (Table 9); Yard trimmings composting sites (Table 10); Yard trimmings + food waste composting only sites (Table 11); Multiple organics composting sites (Table 12); Biosolids composting sites (Table 13); and Livestock manure digesters (Table 14).

STATE OFFICIALS' INSIGHTS

BioCycle concludes its 2017 *State of Organics Recycling In The U.S.* with a summary of some state officials' insights and explanations about the information they were able or unable to provide in the "State Snapshot Survey." *BioCycle* editors thank all

state officials who provided data (or explained why they could not) for our 2017 report, as well as various organizations and associations that helped fill in the gaps.

Arizona: Without any regulations mandating reporting, it's very hard for the Arizona Department of Environmental Quality to gather organics recycling data. This is compounded by having only one full-time employee overseeing the entire recycling program.

Georgia: Facilities that only compost yard trimmings are not required to get a permit from the Georgia Environmental Protection Department (Georgia EPD) or provide notification for permit-by-rule facilities. In addition, the operating status of most yard trimmings composting sites is unknown since they are not required to report to Georgia EPD. However, with the significant reduction in inert landfills in Georgia over the past couple of years, the EPD notes that, most likely, more yard trimmings are being mulched or composted. Further, explains a Georgia EPD official, "due to the difficulty in some of the more rural counties to carry yard trimmings to a composting or mulch facility, a Yard Trimming Landfill category was created in 2016 in the permit-by-rule section of the Solid Waste Management Rules. Yard trimming only landfills can be established in counties with a population less than 65,000. We have received only one notification for a Yard Trimming Landfill so far. We do not have any estimates on the number of counties that may apply in the future."

Louisiana: The organics recycling official at the Louisiana Department of Agriculture & Forestry reports that the state's "300 yard trimmings sites are nearly all licensed arborists trying to beneficially use the limbs, trunks and similar tree debris generated by their work. Most produce mulch; probably 20 percent also produce finished compost." Based on that data, *BioCycle* reported 60 yard trimmings composting operations in Louisiana.

Massachusetts: *BioCycle* followed up with the Massachusetts Department of Environmental Protection (MassDEP) about its categorization of composting facilities by feedstock type in its "State Snapshot Survey" response. The MassDEP official explains that MassDEP doesn't have the data to clearly identify which composting sites in the state are handling yard trimmings only (Table 2), noting that a number of the facilities listed as taking multiple organics are "probably yard trimmings only — or at least primarily. ... But data is not available to know that clearly."

Minnesota: Officials from the Minnesota Pollution Control Agency (MPCA)

Table 8. State programs to support composting, AD, state by state summary

State	Grants	Loans	Tax Incentives	Technical Assistance	Diversion Mandates	Yard Trimmings Disposal Ban	Food Waste Disposal Ban	Outreach And Education	Operators Training Courses
Alabama	No	No	No	No	No	No	No	No	No
Alaska	No	No	No	No	No	No	No	No	No
Arkansas	No	Yes ¹	Yes ²	Yes	No	Yes	No	Yes	No
California	Yes	Yes	No	Yes	Yes ³	No	No	Yes	No
Colorado	Yes	No	Yes	Yes	No	No	No	Yes	No
Connecticut	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Delaware	No ⁴	No ⁴	No	Yes	Yes	Yes	No	Yes	No
District of Columbia	No	No	No	Yes	Yes	No	No	Yes	No
Florida ⁵	No	No	No	Yes	No	No	No	Yes	No
Georgia	No	No	No	Yes	No	No	No	Yes	Yes ⁶
Hawaii						No			
Idaho	No	No	No	Yes	No	No	No	No	Yes
Illinois						Yes			
Indiana						Yes			
Iowa	No	Yes	No	n/a	Yes	No	No	n/a	No
Kansas	No	No	No	Yes ⁷	No	No	No	Yes ⁷	Yes ⁷
Kentucky	No	No	No	No	No	No	No	No	Yes
Louisiana	No	No	No	Yes	No	No	No	Yes	Yes
Maine	No	No	No	No	No	No	No	Yes	Yes
Maryland	No	No	No	No	No	Yes	No	Yes	No
Massachusetts	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes
Michigan	Yes	No	No	Yes	No	Yes	No	Yes	Yes
Minnesota	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No
Mississippi	Yes	No	No	Yes	No	No	No	Yes	No
Missouri	Yes	No	No	Yes	Yes	Yes	No	No	No
Montana	No	No	No	Yes	No	No	No	Yes	Yes
Nebraska	Yes	No	No	No	No	Yes	No	Yes	No
Nevada	No	No	No	No	No	No	No	No	No
New Hampshire	No	No	No	Yes	No	Yes	No	Yes	Yes
New Jersey						Yes ⁸			
New Mexico	Yes	No	No	Yes	No	No	No	Yes	Yes
New York	Yes	No	No	Yes	No	No	No	Yes	No
North Carolina	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes
North Dakota	No	No	No	No	No	No	No	Yes	Yes
Ohio	Yes	Yes ⁹	No	Yes	No	Yes	No	Yes	Yes
Oklahoma	No	No	No	Yes	No	No	No	Yes	No
Oregon	No	No	No	No	No	No	No	No	No
Pennsylvania	Yes	No	No	No	No	Yes ⁸	No	No	No
Rhode Island	No	No	No	No	No	No	Yes	No	No
South Carolina	Yes ¹⁰	No	Yes ¹¹	Yes	No	Yes ¹²	No	Yes	Yes ⁶
South Dakota	Yes	Yes	No	Yes	No	Yes	No	Yes	No
Tennessee	Yes	No	No	Yes	No	No	No	Yes	No
Texas	No	No	No	No	No	No	No	Yes	No
Utah						No			
Vermont	Yes ¹³	No	Yes ¹⁴	Yes	Yes	Yes	Yes	Yes	Yes
Virginia	No	No	Yes	No	No	No	No	No	No
Washington	Yes	No	No	Yes	No	No	No	Yes	Yes
West Virginia						Yes			
Wisconsin	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Wyoming	No	No	No	Yes	No	No	No	No	No

¹Small business loan program (not specific to composting but equipment may be eligible); ²Recycling tax credit; ³Mandate landfill diversion of nonresidential green waste and food waste over certain amount/generator category; ⁴Grant and loan program exists, but funding depleted; ⁵Recycling credits; ⁶Offered occasionally; ⁷Compost operator training only; ⁸Leaves only; ⁹Loans for anaerobic digesters only; ¹⁰Backyard compost only; ¹¹No sales tax on recycling equipment; ¹²Only banned from Class 3 landfills, which are generally MSW landfills only. Can be disposed in Class 1 and Class 2 landfills; ¹³Not to private composters or AD directly; ¹⁴No sales tax on compost.

explain that composting data in the state is compiled from SCORE reports submitted by Minnesota counties annually, which include information about all the waste generated in the county and the various recycling/composting/recovery programs. They noted that MPCA is working to improve its facility reporting processes, and plans are underway to implement hauler reporting as well. Finally, MPCA does not require a permit for any site that has under 120 cubic yards of material on site at any one time, thus the number of on-site composting facilities in the state “is hard to predict.”

Missouri: With all the budget cuts over the last few years, the Missouri Department of Natural Resources “doesn’t have any tracking on organics recycling,” notes a state official. *BioCycle* utilized its own data for Missouri.

Nebraska: The Nebraska Department of Environmental Quality (NDEQ) reports that many small composting sites are exempt from permitting and therefore NDEQ “does not have the data to address accurately the amount of yard waste that is being composted.” The official adds that all grass and leaves are banned from MSW landfills in Nebraska unless they have an approved

gas recovery system. “Currently three of our larger landfills have an approved gas recovery system and therefore the yard waste is not diverted from these landfills,” he explains.

New Hampshire: The New Hampshire Department of Environmental Services does not collect much data on composting, unless it is a permitted food waste composting facility, notes the state official, who adds that yard trimming composting is permit-exempt, therefore no data is collected.

New Mexico: An official with the New Mexico Environment Department notes the state’s solid waste rules do not require on-site composting operations to register, provided they are only composting materials generated on their own site and using the compost product on their own site. “For this reason, we have only a small number of on-farm composters who are registered with the Environment Department, although there are certainly many more operating in the state,” the official explains. Interestingly, the “other” category in Table 2 represents a number of small slaughterhouses and butcher shops that compost only offal. The official also notes that New Mexico does not have any permitted or registered anaerobic digestion facilities in the state, but if AD facilities are developed, they would be regulated as a “transformation facility” under the state’s Solid Waste Rules.

Table 9. State ranking, total composting sites

State	Total Composting Facilities
Ohio	419
New York	347
New Jersey	301
Florida	269
Wisconsin	266
Massachusetts	262
California	249
Pennsylvania	217
Louisiana	215
Kansas	184
New Hampshire	162
S. Dakota	143
Connecticut	140
Minnesota	129
Washington	126
Maine	121
Indiana	119
Michigan	114
N. Dakota	81
Iowa	80
N. Carolina	64
District of Columbia	63
Oregon	60
Illinois	58
Montana	45
Georgia	42
New Mexico	41
Utah	37
Texas	34
Colorado	33
Kentucky	33
Virginia	33
Wyoming	29
Arkansas	27
Rhode Island	24
S. Carolina	23
Maryland	18
Mississippi	15
Oklahoma	14
Vermont	14
Missouri	11
Nebraska	10
Nevada	10
Tennessee	8
Arizona	6
Alaska	5
Delaware	5
Idaho	5
Hawaii	2

Table 10. State ranking, yard trimmings composting sites

State	Yard Trimmings Composting Sites
New Jersey	295 ¹
Ohio	292
Wisconsin	244
Florida	225
Pennsylvania	158
New Hampshire	150
S. Dakota	141
New York	133
Kansas	116
Minnesota	115
Indiana	110 ²
Connecticut	109
Michigan	102
Maine	80
N. Dakota	69
Louisiana	60
Illinois	47
California	39
Montana	24
Kentucky	23
N. Carolina	22
Rhode Island	21
Utah	18 ¹
Arkansas	16
Oregon	16
Maryland	14
Mississippi	10
Virginia	8
Missouri	6
Oklahoma	5
Washington	5
New Mexico	4
Tennessee	4
Texas	4
S. Carolina	3
Arizona	2
Delaware	2
Nebraska	2
Colorado	1
Georgia	1
Nevada	1
Vermont	1

¹Source: State of Composting in the U.S. (ILSR, 2014); ²Source: Indiana Recycling Coalition.

Table 11. State ranking, yard trimmings + food waste only composting sites

State	Yard Trimmings + Food Waste Sites
Washington	55
Kansas	41
California	21
N. Carolina	19
Wisconsin	18
Pennsylvania	16
New York	12
Illinois	10
Indiana	9
Michigan	9
Oregon	6
Connecticut	4
Mississippi	4
S. Carolina	4
Utah	4 ¹
Maryland	3
Missouri	3
Colorado	2
New Hampshire	2
New Mexico	2
Tennessee	2
Arizona	1
Kentucky	1
Virginia	1

¹Source: State of Composting in the U.S. (ILSR, 2014)

Table 12. State ranking, multiple organics composting sites¹

State	Multiple Organics Composting Sites
Massachusetts	185
Ohio	93
California	78
Louisiana	50
New York	40
Oregon	20
Texas	20
Maine	15
New Mexico	14
Florida	11
Montana	10
Minnesota	9
N. Dakota	9
Vermont	9
Colorado	7
Nevada	6
New Hampshire	6
Arkansas	5
Virginia	4
Idaho	3
Oklahoma	3
Wisconsin	3
Arizona	2
Delaware	2
Kentucky	2
Nebraska	2
N. Carolina	2
Washington	2
Maryland	1
Michigan	1
Mississippi	1
New Jersey	1
Rhode Island	1
S. Carolina	1
S. Dakota	1
Tennessee	1

36 states reporting

¹Taking more than yard trimmings and/or food waste, e.g., yard trimmings, food, manure, wood shavings, industrial organics, etc.

New York State: The New York State Department of Environmental Conservation (NYDEC) has the following regulatory categories for yard trimmings and/or source separated organic waste (SSOW) operations based on the quantity and types of feedstocks:

- Registered SSOW: <1,000 cubic yards (cy) SSOW/year
- Permitted SSOW: >1,000 cy SSOW/year
- Exempt Yard Waste: <3,000 cy yard waste/year
- Registered Yard Waste: 3,000–10,000 cy yard waste/year
- Permitted Yard Waste: >10,000 cy yard waste/year

Explains the NYDEC official: “You can get a registration or permit as a SSOW composting facility; New York State has 40 facilities that are registered/permitted to take food waste,

Table 13. State ranking, biosolids composting sites

State	Biosolids Composting Sites
New York	31
Florida	29
Washington	19
California	17
N. Carolina	15
Utah	15 ¹
Maine	14
New Mexico	10
Texas	10 ¹
Massachusetts	9
Pennsylvania	9 ¹
Colorado	8
Oklahoma	6
Oregon	6
Georgia	5
Nebraska	5
New Jersey	5
Arkansas	4 ¹
Kentucky	4
New Hampshire	4 ¹
Ohio	3
Virginia	3
Alaska	2
Hawaii	2
Idaho	2
Michigan	2 ¹
Missouri	2
Arizona	1
Connecticut	1
Delaware	1
Illinois	1
Montana	1
Nevada	1
Rhode Island	1
Wisconsin	1
N. Dakota	0

¹Source: “Biosolids Composting In The United States — 2010 Update,” BioCycle, Vol. 51, No. 12, 35-41.

which is their primary feedstock. They may also accept yard waste if it is under 3,000 cubic yards as that is considered an exempt activity. We include those in the multiple organics category. On the other hand, we have 12 facilities that are registered/permitted to accept SSOW and yard trimmings.”

Wisconsin: The Wisconsin Department of Natural Resources does not regulate on-farm composting operations or composting operations that have less than 50 cubic yards of material on-site at one time. That covers most school and university composting operations.

Wyoming: Insights on organics recycling infrastructure in the state were provided by the official with the Wyoming Department of Natural Resources (DNR): “Unfortunately, the

Table 14. State ranking, livestock manure digesters¹

State	Livestock Manure Digesters
New York	35
Wisconsin	33
Pennsylvania	30
California	19
Vermont	18
N. Carolina	10
Indiana	9
Michigan	9
Washington	9
Minnesota	7
Oregon	7
Idaho	6
Iowa	4
Mississippi	4
Ohio	4
Utah	4
Illinois	3
Massachusetts	3
Missouri	3
Arizona	2
Florida	2
S. Carolina	2
Texas	2
Wyoming	2
Arkansas	1
Colorado	1
Connecticut	1
Georgia	1
Kansas	1
Kentucky	1
Maine	1
Maryland	1
Montana	1
Nebraska	1
Oklahoma	1
S. Dakota	1
Virginia	1

¹Source of data: USEPA AgSTAR and some individual states (see Table 2 for states reporting Livestock manure digester data).

DNR doesn’t track much. All but one of the state’s municipal solid waste facilities are operated by local governments. Many compost green waste (grass clippings, leaves, garden plants, etc.), but it’s pretty small scale. A couple larger communities (Casper and Cheyenne, for example) operate fairly large composting yards, but they are not required to report to the DNR. Also, the DNR does not have separate rules for composting or AD facilities. A single chapter of the rules (Chapter 6) regulate all solid waste transfer, treatment, and storage facilities. Permit requirements are tailored to the type of waste managed using accepted standard practices for the waste management activities as a guide to how waste should be managed.” ■

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