



MICHIGAN

BIOSOLIDS MANAGEMENT 2018 - STATE SUMMARY

This summary, a dashboard of state statistics & further data are at www.biosolidsdata.org

In Michigan...

- *Detroit and other Michigan municipalities put a lot of biosolids to agricultural use. Landfill disposal is also common; historically, incineration was used for a large portion of Michigan's biosolids, but that has diminished substantially.*
- *Detroit's Great Lakes Water Authority (GLWA) dominates biosolids production. The amount of land application of biosolids from GLWA in Michigan varies from year to year; in 2018 most of its new dried pellet fertilizer was shipped to Canada for land application. More has been applied in Michigan in recent years.*
- *PFAS started becoming a significant issue for several Michigan WRRFs in 2018, with Class B land application programs suspended/impacted. Michigan has been a leader in addressing the issue proactively.*

Biosolids Management in Michigan

Most Michigan biosolids are recycled to soils on agricultural lands, although a large percentage is landfilled and some are incinerated (Figure 1). More than 50% of the state's WRRFs send their biosolids to land application. The data from 2018 show a significant reduction in the total mass of biosolids managed in Michigan in 2018 compared to 2004. This may be due to reporting errors, data collection limitations (e.g. solids sent out of state may not be tracked), or 2018 being anomalous. In particular, in 2018, Detroit's Great Lakes Water Authority (GLWA) was transitioning into use of its new heat-drying and pelletizing facility. Figure 2 shows Michigan Department of Environment, Great Lakes, & Energy (EGLE) year-by-year data from the past decade. EGLE oversees Michigan's biosolids program.

In Michigan, biosolids are managed by water resource recovery facilities (WRRFs); there are no separate preparers, but there are various private contractors involved in biosolids management. For instance, New England Fertilizer Co. (NEFCO) operates the Great Lakes Water Authority (GLWA) heat-drying facility. Also, as is common across the country, WRRFs hire contractors who specialize in land application, and whose services typically include administration, sampling, transportation, and land application of biosolids on behalf of the WRRF. Several smaller WRRFs store solids for years or decades and/or transport them to larger facilities for treatment. When these sludge storage lagoons are cleaned out and the solids are land applied, they must go through an EGLE authorization, as is the case for all MI WRRF biosolids programs. WRRFs must also provide an annual report to EGLE that summarizes the land application activity. Roughly 5-10 such clean-outs occur each year, and the 2018 data reported here include those.

Battle Creek, Genesee County, Grand Haven (Spring Lake), Grand Rapids (aka Grand Valley), Lansing, Port Huron, Saginaw, and Saginaw Township are examples of WRRFs that land applied Class B biosolids treated with alkaline stabilization in 2018. Ishpeming is the state's only biosolids composter, creating an EQ product used in landscaping and gardens. There have been a few others who have tried composting; Battle Creek piloted composting in 2019-2020 and may go to full composting in 2021. Wyoming, long a leader in biosolids recycling in Michigan, is now combined in Grand Valley Regional with Grand Rapids, and while Wyoming solids are still land applied, others in that consortium – including Grand Rapids – are landfilled.

Three Michigan WRRFs incinerated all or some of their solids in 2018: Warren (22 MGD), Ypsilanti Community Utilities Authority (YCUA, 22.3 MGD), and Detroit-based GLWA (750 MGD). The number of sewage sludge incinerators (SSIs) has diminished over the past two decades as a result of aging infrastructure and new U. S. EPA Clean Air Act regulations on air emissions. For example, GLWA had 14 incinerators in the past, and, in 2018, only eight were still operational.

In 2020, there is growing interest from composters of non-biosolids feedstocks to be able to include biosolids, and EGLE is working on compost regulations and how biosolids might be added to composting permits.

There are no out-of-state WRRFs that currently land apply bulk biosolids in Michigan. As in other states, there are bagged retail Class A EQ products distributed in Michigan. Those are regulated as fertilizer and registered through the agriculture department, not thru EGLE. (The data presented here do not include any biosolids produced outside of Michigan.)

By 2018, Michigan had begun to wrestle with PFAS – perfluorinated chemicals showing up worldwide in the environment – including in wastewater and biosolids. Michigan state agencies, led by EGLE, began aggressively testing and addressing the issue, eventually facilitating industrial source reductions from metal plating and other industrial facilities discharging to WRRFs. A number of biosolids land application programs, including Lapeer and Wixom, were suspended and forced to landfill biosolids at considerably increased costs. In 2020, the state's biosolids coordinator estimated that he spends 80% of his time working on addressing the PFAS challenge related to biosolids management.

Figure 1

Michigan Biosolids Use & Disposal 2018
(dry US tons, %)
Total: 282,900

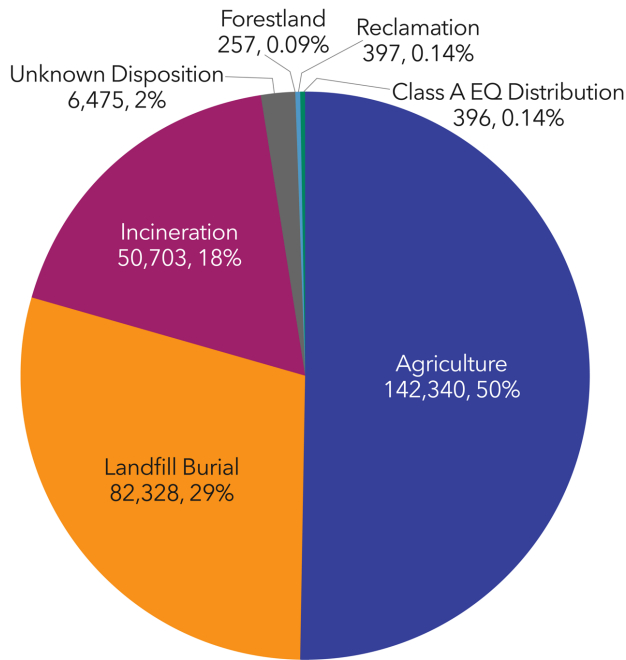
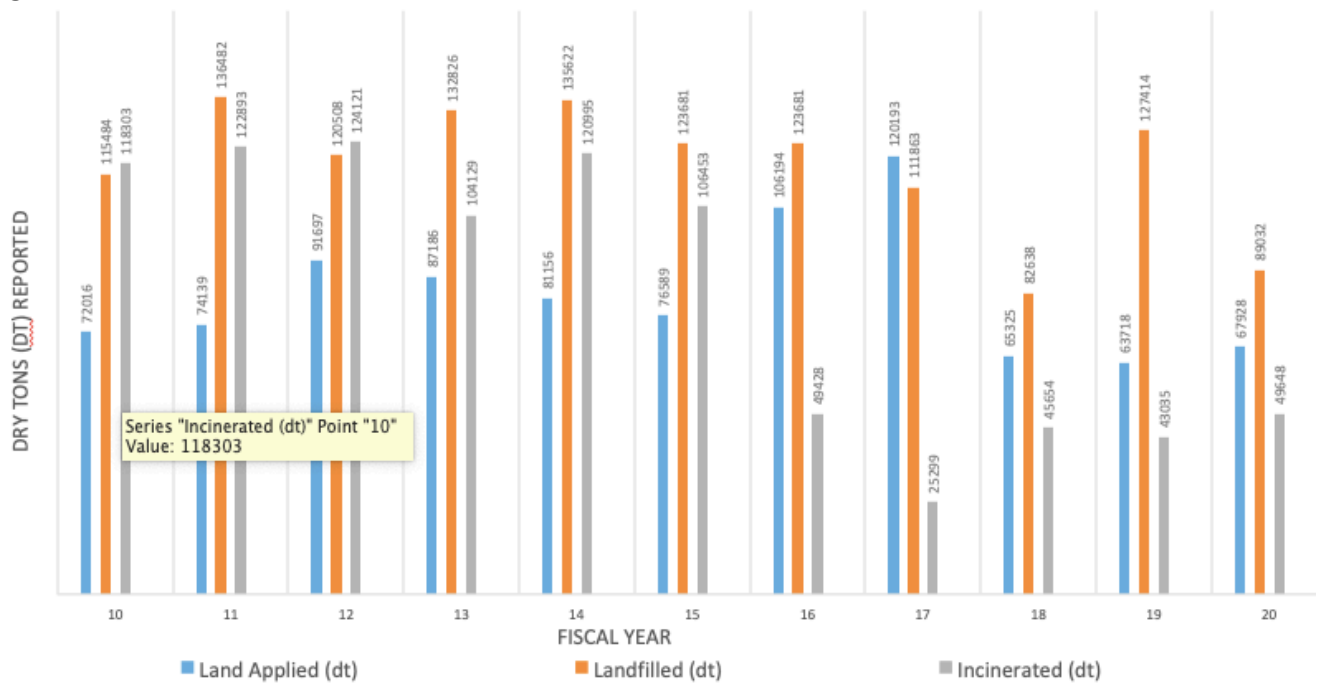


Figure 2



Courtesy EGLE. The years shown are fiscal years, which run Oct. 1 of the prior year to Sept. 30 of the year shown. These data do not include the 76,807 dry U.S. tons of GLWA/Detroit biosolids pellet fertilizer land applied outside of Michigan in 2018.

Agency/Department Oversight

Michigan is delegated by U.S. EPA to run the biosolids regulatory program under the EPA 40 CFR Part 503 rule. The Michigan Department of Environment (EGLE) oversees biosolids management through a robust program, going well beyond the basic requirements and oversight of the federal Part 503 regulations. Michigan’s biosolids management and regulatory program is described by the MI EGLE website as follows:

Michigan’s Biosolids Program is regulated by EGLE’s Water Resources Division (WRD), under the authority of Part 31 of the Water Resources Protection of the Natural Resources and Environmental Protection Act, 1994 PA 451, Michigan’s Part 24 Administrative Rules.

State Regulations and Permitting

The Michigan biosolids regulations were promulgated in 1999 and have had only one statutory revision, in 2012, which was not extensive – just some details added about how to handle bulk Class A EQ biosolids for home use.

EGLE does not closely track biosolids-related odor complaints, but an estimated 5-10 occur each year. The Water Resource Division has a general system for handling complaints, but no system to handle biosolids odor complaints specifically, though they do have a way to document educational conversations with neighbors and others.

Pressures on Biosolids Management and Land Application

Pressures on biosolids in Michigan as of 2018, as identified by the state biosolids coordinator, include...

1. PUBLIC INVOLVEMENT – concerns of neighbors, environmental groups, and others
2. MANAGEMENT ISSUES – the hassle of biosolids recycling/land application
3. COST – disposal options are least expensive
4. AGRICULTURAL ISSUES – declining farmland due to less agriculture or due to development, sprawl, seasonal restrictions, or competition with manures, etc.
5. REGULATIONS ON BENEFICIAL USE – strict EPA and/or state regulation and enforcement

As of 2018 and 2020, the beneficial use of biosolids in Michigan was not increasing. As notes above, PFAS and other pressures are restricting some biosolids recycling programs.

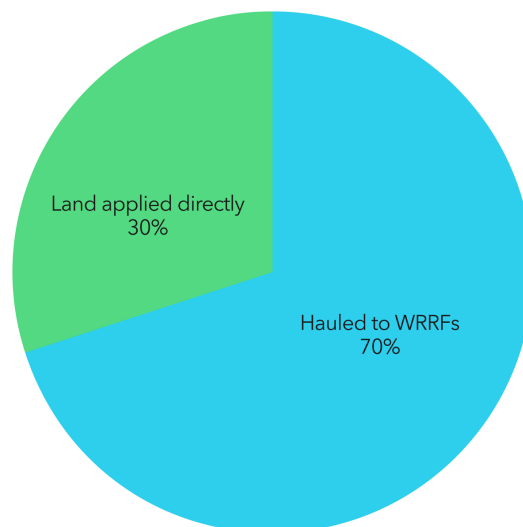
Septage Management

Septage haulers based in state:	266
In-state separate preparers (not WRRFs) taking septage:	5
WRRFs required to take septage?	No

WRRFs that accept septage:	76
Septage received at WRRFs in 2018 (gallons):	no data
Other outside wastes accepted at WRRFs:	no data
Is fats/oil/grease (FOG) a significant issue?	Yes
Is it regulated?	Yes
How?	septage regulations
	wastewater permits regulations; liquid industrial byproducts
Is there a proactive program to collect FOG?	Yes
Can septage be land applied in state?	Yes
If yes, what treatment is required?	Screening is the only treatment required for injection or immediate incorporation. Treatment required for surface application without incorporation.
Most recent septage regulations update:	1994
Full-time equivalent (FTE) at state agency for septage:	5
Notes:	NBDP estimate of septage production annually: 9.3 million gallons

Figure 3

Michigan Septage Management 2018
(% estimated)



Major WRRFs, Separate Preparers, and Notable Projects

- The Great Lakes Water Authority (GLWA) owns and operates the largest WRRF in Michigan. In fact, it is “the largest single-site treatment facility in North America” (GLWA.org). For more than five decades,

GLWA had operated up to 14 sewage sludge incinerators (SSIs) for sludge management. Typically, GLWA biosolids management consisted of ~67% incineration, ~22% lime stabilization prior to landfill disposal, and ~11% bulk land application. In 2013, the City Council awarded a \$683 million contract to NEFCO to design (with lead engineering by Tighe & Bond), build, and operate the current biosolids heat-drying and pelletization facility, which began operations in fall of 2015. It is the largest biosolids processing facility in North America, costing \$143 million and capable of producing up to 316 dry tons per day (firm capacity; maximum capacity is 420 dt/day) from undigested, centrifuge-dewatered GLWA primary and waste-activated solids. A glycerin coating is added for dust control, and the resulting “MichiGreen” fertilizer (guaranteed N 4%, P 3%) is applied in bulk to lands growing corn, wheat, soy, and hay in Michigan, Indiana, Ohio, and Ontario.

As expected for such a large facility, the new GLWA biosolids operation has faced challenges, including air emissions control issues during start-up (e.g. exceeding SO₂ in 2017) and biosolids recycling opposition (e.g. Perkins, 2020). There have also been issues to work out in the agricultural use of the new and improved Detroit biosolids. In early 2018, nuisance complaints and concerns about nutrient runoff led to new state guidelines specifically for the management of bulk EQ biosolids. The guidelines were developed in a collaborative process involving the Michigan Water Environment Association (MWEA), MI Farm Bureau, the state agriculture department, EGLE, state legislators, and farmers.

- One example of a smaller WRRF is one in western Michigan that manages solids in two ways. In 2018, half of this 9.5 MGD facility’s 5,644 dry U. S. tons of solids were applied as Class B liquid (averaging 5.5% solids) on 1,095 acres by a contract hauler. The other half went to landfill as 25% dewatered cake. The land applied biosolids fertilized feed corn, wheat, and soy crops. The biosolids manager noted that “Our issues are...having too little storage for Class B biosolids. Our area has been fortunate to continue to grow over the past 30 years; unfortunately that means land application fields continue to become farther and farther away. Landfills capping the amount of dewatered solids they will receive and charging exorbitant prices are another large area of concern.”
- Flint is an example of a biosolids management system evolving. “In 2009, the City [of] Flint signed a partnership agreement with Swedish Biogas International, LLC (www.bioworksenergy.com) for the reduction of sludge volume by implementation of an anaerobic digestion process. The digestion process also produces biogas, which in the future will be used to make electricity” (<https://www.cityofflint.com/public-works/water-service-center/water-pollution-control/>). Then, in about 2015, the Flint Water Pollution Control facility decommissioned its sewage sludge incinerator, which was getting old and would be costly to retrofit to meet new federal U.S. EPA air emissions standards. In 2020, a major set of improvements at the facility – including improved solids dewatering – were approved, with an anticipated cost of \$141 million over the next several years.
- The Michigan Water Environment Association (MWEA) has an active and effective biosolids committee that produces an annual biosolids conference and collaborates on the “Michigan Biosolids Team” with representatives of EGLE, the MI Department of Agriculture & Rural Development (MDARD), MI Farm Bureau, and Michigan State University Extension on biosolids policy and management. They provide

excellent online educational resources about biosolids (e.g. https://www.mi-wea.org/biosolids_-_land_application.php).

- As noted above, Ishpeming is the only biosolids composter in Michigan. Its biosolids compost product provides an example of biosolids pricing; its wholesale price is \$5/cubic yard (or “per bucketload” of the facility’s front-loader) and the retail price is \$15/cubic yard.

References

The state biosolids coordinator and other state biosolids experts provided most of the information in this summary report. Additional information was obtained from:

About the GLWA biosolids program:

<https://www.glwater.org/our-system/wastewater-system/>

<http://www.nefcobiosolids.com/view-our-projects/detroit-mi/>

<https://www.freep.com/story/news/local/michigan/wayne/2017/05/09/detroit-waste-conversion-plant-air-pollution/101328136/>

<https://www.tighebond.com/project/biosolids-dryer-facility/>

BioWorks Energy LLC:

<https://bioworksenergy.com/anaerobic-digestion>

CDM Smith (Spargimino et al.), 2020. Cost Analysis of the Impacts on Municipal Utilities and Biosolids Management to Address PFAS Contamination. Published by NEBRA, NACWA, WEF. <https://www.nacwa.org/news-publications/clean-water-current-archives/clean-water-current/2020/10/29/new-report-showcases-the-cost-impact-of-pfas-on-potws-and-biosolids-management>

Flesher, J. and M. Casey, 2019. Concerns rise over tainted sewage sludge spread on croplands. *Detroit News*. Sept. 12, 2019. <https://www.detroitnews.com/story/news/local/michigan/2019/09/12/concerns-rise-tainted-sewage-sludge-spread-croplands/40116193/>

Flint, MI:

<https://www.cityofflint.com/public-works/water-service-center/water-pollution-control/>

Grand Rapids, MI, 2020. Biosolids Management website. Grand Valley Regional Biosolids Authority.

<https://www.grandrapidsmi.gov/Government/Departments/Environmental-Services/Biosolids-Management>. Accessed 12/28/20.

Huhman, L., 2018. Michigan approves new rules for biosolids. *Lenconnect*.

<https://www.lenconnect.com/news/20180128/michigan-approves-new-rules-for-biosolids>

Michigan Department of Environment, Great Lakes, and Energy (MI EGLE), 2021, biosolids website:

<https://www.michigan.gov/biosolids>. Accessed 1/12/21.

Michigan State University:

https://www.canr.msu.edu/resources/applying_biosolids_to_land_in_michigan_e2780

Michigan WEA. All About Land Application of Biosolids. https://www.mi-wea.org/biosolids - land_application.php. Retrieved 1/5/21.

Michigan WEA. 2016. GLWA Owned-NEFCO Operated Biosolids Drying Facility. Presentation to the Biosolids Seminar, July 21, 2016. https://www.mi-wea.org/docs/Kyzar-NEFCO_Dryer_Facility.pdf

mlive:

<https://www.mlive.com/news/2019/06/the-hunt-for-pfas-turns-to-michigan-farms-using-human-waste-as-fertilizer.html>. Accessed 4/16/21.

<https://www.mlive.com/news/2019/05/flint-will-turn-food-waste-into-energy-at-water-pollution-plant.html>

Perkins, Tom. 2020. "Toilet to table..." *Metro Times*. <https://www.metrotimes.com/detroit/toilet-to-table-michigan-farmers-feed-crops-with-toxic-brew-of-human-and-industrial-waste/Content?oid=25017830>

Warren Water Recovery Facility, 2020. <https://www.cityofwarren.org/departments/water-and-sewer-system/warren-water-recovery-facility/>. Accessed 1/13/21.