



OREGON

BIOSOLIDS MANAGEMENT 2018 - STATE SUMMARY

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

In Oregon...

- *Biosolids recycling to soil is encouraged, well-regulated, active, & common.*
- *Many programs throughout Oregon have been land applying biosolids routinely since the early 1990s. Communities - including Portland, Eugene, Springfield, and Gresham - have been recovering energy from biogas, including renewable natural gas (RNG), for many years.*
- *Large farms and ranches in eastern Oregon provide ample opportunities for land application of biosolids that are mostly generated in the more heavily populated and wetter western part of the state. Relatively long biosolids transport distances are common.*

Biosolids Management in Oregon

There are 370 permitted WWTPs in Oregon (OR), but just 15 process 75% of the state's total wastewater flow (Seiple et al., 2020; data from 2012). These 15 larger facilities, with flows greater than 5 MGD, account for most of the biosolids produced. Like their larger facility counterparts, smaller facilities (e.g., < 1 MGD) in Oregon also have active land application programs. The state also has several facilities that utilize sludge lagoons as a form of treatment and storage of biosolids. These facilities remove biosolids from their lagoons and land apply on a periodic basis, typically every 5 – 20 years. Lastly, Oregon has a small but growing number of communities producing Class A biosolids for sale or give-away.

Oregon's biosolids management and regulatory program is described by the Oregon Department of Environmental Quality (OR DEQ) on its website as follows:

The Department of Environmental Quality implements a statewide program that encourages the beneficial use of biosolids in a manner to protect public health and maintain or improve environmental quality. The majority of biosolids generated in Oregon are applied as a soil amendment to enhance agricultural, silvicultural, and horticultural crops. Some biosolids are also being used to revitalize the soil covering landfills in Oregon and to reclaim barren and highly eroded soils.

<https://www.oregon.gov/deq/wq/programs/Pages/Biosolids.aspx>

Most OR biosolids are recycled to agricultural lands as a soil amendment and source of nutrients. The land application programs are primarily conducted by the municipalities on privately-owned and -managed farmland. Additionally, there are WWTPs that contract with hauling companies and landowners for land application. An estimated 30% of Oregon's biosolids are managed by private contractors. An example is, most notably, Madison Farms, which has managed Portland biosolids for decades (see sidebar).

There is one significant separate preparer in Oregon – Heard Farms, a lagoon facility that treats solids from 11 OR WWTPs as well as septage and grease trap wastes and land applies the resulting biosolids on its own farm fields.

The number of WWTPs and final biosolids generated are fairly consistent between 2004 and 2018; some year-to-year variation is expected and may be the reason for the somewhat lower total tonnage reported for 2018.

There are two biosolids products sold in bags in Oregon; however both are produced out of state: Milorganite and Nutripel. The OR DEQ requests data from these companies through a “verbal agreement,” and the companies provide annual data on the amount of their products that are distributed in the state.

A notably robust part of the OR 2018 data are the data on treatment processes in use by the state’s WWTPs. See the OR data spreadsheet for numbers of WWTPs using each stabilization and dewatering technology and the masses of solids processed by each technology. Important findings include:

- As is also common in other states, many smaller OR WWTPs rely on sludge storage lagoons (45 identified in Oregon in this survey).
- Aerobic digestion is commonly used by smaller facilities in OR, as is the case in other states.
- Mesophilic anaerobic digestion (AD) is the next most common treatment technology for OR solids – 19 facilities are identified in this survey as using this form of AD, with more than 32,000 dry U. S. tons of Class B biosolids produced.
- The majority of facilities use drying beds (20), belt filter presses (18), and centrifuges (10). Eight small WRRFs use modern screw presses, a technology that has only been widely available in the past two decades.

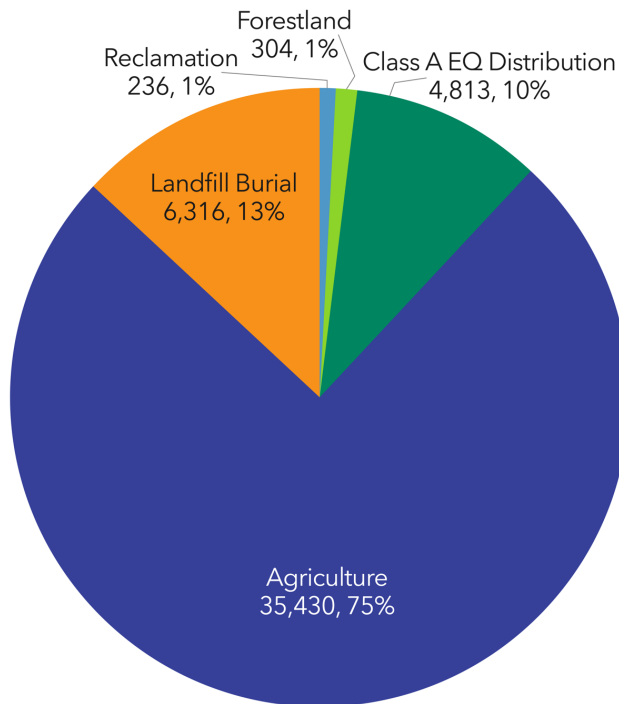
Madison Farms Recycles Portland Biosolids

“Madison Farms is a fourth-generation farming operation that covers 17,500 acres. Class B biosolids from the City of Portland, Oregon, have been beneficially recycled at Madison Farms since 1990. Biosolids amendment has improved soil quality; increased forage production and quality; and increased grazing capacity. Biosolids have also been successfully used to stabilize previously unvegetated sandy soils areas historically plagued by wind erosion, converting them to productive range and farm land as well as wildlife habitat. In addition to traditional crop and soil benefits apparent following biosolids land application, atmospheric greenhouse gas (CO₂) fixation has been recognized at Madison Farms via increased soil carbon and biomass storage. Carbon emitted from diesel consumed to haul and apply biosolids is roughly eight times less than that captured from the atmosphere and sequestered as stored soil organic carbon or converted into crops and livestock. With the regional interest in using alternative carbon-neutral fuels, Madison Farms expanded its use of biosolids to fertilize canola. Economics of growing and marketing canola resulted in a branded local product- OregonGrown Biodiesel and high quality meal (livestock feed). The use of locally produced biodiesel further improves the carbon footprint for the City of Portland and Madison Farms. By recognizing and using both the carbon and nutrient benefits of biosolids, this recycling program is demonstrating a route to sustainable agriculture.”

Source:

https://www.researchgate.net/publication/272207785_Biosolids_Benefits_on_Semi-Arid_Central_Oregon_Agriculture

Oregon Biosolids Use & Disposal 2018
(dry US tons, %)
Total: 47,100



Agency/Department Oversight

The OR DEQ oversees biosolids management in the state through its water/wastewater division. It is a robust program, going well beyond the basic requirements and oversight of the federal Part 503 regulations, based on metrics collected in this survey. Additional state requirements include:

- Facilities' permits require development of a biosolids management plan (BSMP) and a land application plan.
- Site authorizations are developed based on the BSMP and state-issued, site-specific site authorization.
- Regarding legal liability, “the WWTP/generator is ultimately responsible, but we have issued warning letters to land-owners who do not abide by the use restrictions,” said the OR DEQ biosolids coordinator.

The OR DEQ biosolids program website is informative and comprehensive:

<https://www.oregon.gov/deq/wq/programs/Pages/Biosolids.aspx> The public can access some reports there and can make public records requests (as this project did) for additional data and information. Biosolids reports and data are only kept in paper format. However, the state coordinator has created a currently “unofficial” electronic database used to track and summarize biosolids data.

Pacific Northwest Extension, which includes OR State University, provides research and technical expertise on biosolids management, advising land appliers, WWTPs, regulators, and other stakeholders. For example, in September 2018, it published a summary of research on “Biosolids in Dryland Cropping Systems,” including research on soil and crop improvements at Madison Farms.

OR DEQ’s biosolids program receives some nuisance and odor complaints associated with biosolids management programs. In 2018, Heard Farms was the site of most of these odor complaints, as its land application operations were expanded. Considering that 95% of OR biosolids are applied to soils, the number of complaints is relatively small.

State Regulations and Permitting

OR DEQ regulates biosolids through each individual WWTP’s NPDES permit or state-issued wastewater treatment permit. The OR biosolids regulations are more involved than the federal Part 503 requirements. For example, when it comes to pollutants in biosolids, the state follows the federal Part 503 criteria for metals, but some WWTPs have requirement for dioxin testing in their permit. Overall, each Water Quality permit has biosolids requirements in it, and some permits have additional testing requirements written in, if the WWTP has a contaminant of concern. As of 2020, OR DEQ is developing a general land application permit program, like the one Washington state has. The new general permit may also include industrial residuals.

Pressures on Biosolids Management and Land Application

Pressures on biosolids in OR as of 2018 include...

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

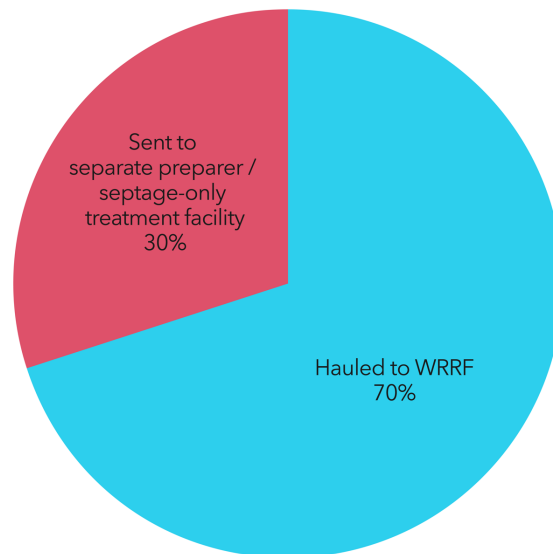
The state coordinator notes that “Some farmers do not want to deal with the government placing restrictions on their activities and see the biosolids program as too restrictive.”

As of 2018 and 2020, the beneficial use of biosolids was staying the same (see Dashboard), according to the state biosolids coordinator.

Septage Management

An estimated 182 septage haulers operate in Oregon, hauling septage to about 40 WWTPs that accept septage (Table 1). Septage can be land applied, and about 18 septage haulers treat septage (like separate preparers) by alkaline stabilization and land apply it directly, in accordance with state requirements.

Oregon Septage Management 2018
 (% estimated)
 Total: 21,405,300 gallons



Oregon Septage Management

| | |
|---|--|
| Septage haulers based in state: | 182 |
| In-state separate preparers (not WRRFs) taking septage: | 40 |
| WRRFs required to take septage? | No |
| WRRFs that accept septage*: | 40 |
| Septage received at WRRFs in 2018 (gallons): | 21,405,358 |
| 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 |
| Is there a proactive program to collect FOG? | No |
| Can septage be land applied in state? | Yes |
| If yes, what treatment is required? | Meet Part 503 and the following additional state requirements: Land application of septage is restricted. |
| Most recent septage regulations update: | 2014 |
| Full-time equivalent (FTE) at state agency for septage: | 1 |
| Notes: | |
| We did not track other hauled wastes in 2018 | |
| Septage regulations had minor modifications completed in 2018. Our septage program is covered by less than 1 FTE. | |

* There are 40 facilities that accept septage, 18 are private alkaline stabilization facilities and 22 of them are publicly owned wastewater plants.

Major WWTPs, Separate Preparers, and Notable Projects

In addition to the Madison Farms and Heard Farm programs mentioned above, Oregon's biosolids management includes several notable operations:

- City of Portland Environmental Services treats an average 70 MGD of wastewater at the Columbia Boulevard Treatment Plant, which provides most of the treatment needs for 600,000 customers in the City's service area. Solids management includes anaerobic digestion (AD) and biogas use. As of 2018, electricity had been generated with two 850 kW engine generators, and some refined, compressed renewable natural gas (RNG) had been provided to a neighboring industrial facility since the late 1980s. Beginning in 2017, the RNG program has been expanded to put to use all of the WWTP's biogas, fueling City vehicles and being sold into NW Natural's renewable fuel pipeline. The project was expected to increase Environmental Services annual revenues by \$3 million and cut greenhouse gas emissions 21,000 tons/year. As discussed above, most of Portland's biosolids are land applied at Madison Farms - 5,792 dry U.S. tons in 2018 – and at a newer area in Sherman County (2,138 dry U.S. tons in 2018). In 2018, 1,206 dry U.S. tons of Portland biosolids were sent to a Wasco County Landfill.
- Clean Water Services “cleans 65 million gallons of wastewater each day, on average, for over 600,000 customers in urban Washington County [just west of Portland]. The wastewater is collected by a vast network of more than 1,900 miles of sewer pipes and 43 pump stations and routed to one of our four treatment facilities—Durham, Rock Creek, Hillsboro and Forest Grove. The cleaned water is returned to the Tualatin River to be reused.” Clean Water Services is a known leader in resource recovery, including producing phosphorus fertilizer and an average of 31 dry tons of biosolids daily via anaerobic digestion (AD). The biosolids are applied on farmland in eastern Oregon and the Willamette Valley. Biogas from the AD operations is increased by the annual addition of ~150,000 gallons of fats, oils, and grease (FOG) [PER YEAR??] to the digester at the Durham WRRF, producing enough power to meet 60% of that facility's needs. The Rock Creek WRRF produces 30% of its power needs through use of its biogas.
- The City of Newport is a community of 10,680 (2018 estimate) in the mid-coast region southwest of Portland. Its Vance Avery WWTP typically treats about 2 million gallons/day (MGD) and produces a bulk Class A biosolids that has been successfully applied on area farm lands for many years, benefitting the local farm economy. Over the years, there was some pushback by neighbors who are upset about malodors and claim the Siletz River is being impacted negatively. Others – including the biosolids program staff - rebut the claims of river impacts. In 2018, the debate expanded and caught the attention of county and state representatives. And the debate continues.
- The Gresham Wastewater Treatment Plant was one of the pioneers in producing more renewable electricity than it uses. In 2015, the Plant became the Pacific Northwest's first “net zero” wastewater treatment system. It did so by ensuring energy efficiency in its operations

and by taking in fats, oil, and grease (FOG) to boost biogas production in its anaerobic digesters. The biogas is burned in engine generators, producing heat and power. Annual savings are \$500,000.

References

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

Portland, OR:

<https://www.portlandoregon.gov/bes/article/41872>

<https://www.portlandoregon.gov/bes/article/40669>

<https://www.portlandoregon.gov/bes/article/636244>

Portland Biosolids Management Plan, 2019, including 2018 data:

<https://www.oregon.gov/deq/wq/Documents/2019PortlandBiosolidsManPlan-Part1.pdf>

Heard Farms:

<https://heardfarmsinc.com/>

Oregon State University:

https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/pnw508_0.pdf

<https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/pnw716.pdf>

Treatment Plant Operator:

<https://www.tpomag.com/editorial/2010/03/the-old-with-the-new>

Newport, OR:

<https://www.newportoregon.gov/dept/pwk/wwtp.asp>

Newport News Times:

<https://newportnewstimes.com/article/newport-grapples-with-biosolids>

Clean Water Services:

<https://www.cleanwaterservices.org/about-us/one-water/resource-recovery/>

Gresham, OR:

<https://greshamoregon.gov/Wastewater-Treatment-Plant>