OREGON ENVIROTHON

CURRENT ISSUE 2022: Waste to Resources

Learning Objectives

Oregon has more than 4 million people calling it home. Like every state, Oregon is tasked with servicing its residents while also sustaining its natural resources across diverse geographic regions. As a by-product of its growing population, the state is faced with the responsibility of managing different types of waste generated by individuals, households, communities, businesses, manufacturing, agriculture and industry. Waste of all kinds has the potential to affect the environment and our natural resources. From the water we drink to the land we live on, our decisions about how to manage waste impact our communities and the world around us. How can we make responsible choices about our waste? How can we manage our growth in a way that is sustainable? How can we turn our waste into resources?

These challenges make Oregon well-positioned to enact innovative and creative solutions for managing its waste regeneratively, turning waste products into usable resources through restoration, repurposing and recycling for the benefit of the natural environment and future generations.

Students will learn the concepts of different waste streams and the impacts of waste generation and disposal on natural resources and society. Students will also learn effective ways to manage waste regeneratively, as well as the social, economic, and political impacts of turning waste products and degraded lands into resources.

Key topics include:

1. Understand how landfills function and how hazardous waste is properly handled and disposed.
2. Understand the importance of reusing, recycling and diverting products from becoming waste to conserve natural resources.
3. Understand how much food is wasted relative to supply, and the importance of composting and how it supports soil health, water conservation efforts and waste diversion.
4. Understand combustion with energy recovery (waste-to-energy) systems and facilities and compare carbon sequestration methods as a potential energy source.
5. Understand the different management and innovative treatments for human and animal waste and the potential environmental impacts if not effectively managed.
6. Understand brownfields and the potential environmental impacts of degraded lands, and how the state and federal government can assist with removal of toxins and reuse of lands to benefit the community.

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Resources:

Department of Environmental Quality (DEQ):

Recycling and Waste Prevention: https://www.oregon.gov/deq/recycling/Pages/default.aspx

Waste prevention and reuse: https://www.oregon.gov/deq/mm/Pages/Waste-Prevention-and-Reuse.aspx

Materials Management in Oregon: https://www.oregon.gov/deq/mm/Pages/default.aspx

Created 2020, Framework for action: https://www.oregon.gov/deq/mm/Pages/Framework.aspx

Land Quality: https://www.oregon.gov/deq/Pages/Land-Quality.aspx

Food Environmental Impacts and Actions: https://www.oregon.gov/deq/mm/food/Pages/default.aspx

Composting Program: https://www.oregon.gov/deq/mm/swpermits/Pages/Composting.aspx

OSU Master Recyclers:

Master Recyclers Class Documents: https://fa.oregonstate.edu/recycling/events-and-opportunities/master-recycler-class/master-recycler-class-documents

Check out your county's solid waste resources. Example: Metro:

Regional Waste Plan: https://www.oregonmetro.gov/regional-waste-plan

Garbage and recycling: https://www.oregonmetro.gov/tools-living/garbage-and-recycling

Healthy Home: https://www.oregonmetro.gov/tools-living/healthy-home

Composting: https://www.oregonmetro.gov/tools-living/yard-and-garden/composting

Brownfields Assessment Grants: https://www.oregonmetro.gov/tools-partners/grants-and-resources/brownfields-assessment-grants

Waste to Energy: https://www.oregonmetro.gov/health-impact-assessment-waste-energy

Waste Management:

Recycle Right: https://www.wm.com/us/en/recycle-right/recycling-101

Republic Services:

Services and recycling: https://www.republicservices.com/customer-support/faq

History of waste management in the US:

Trash in New York: https://www.collectorsweekly.com/articles/when-new-yorkers-lived-knee-deep-in-trash/

American cities and waste: https://www.atlasobscura.com/articles/when-american-cities-were-full-of-crap

A brief history of waste management: https://247wasteremoval.co.uk/blog/a-brief-history-of-waste-management/

Issues of environmental justice in waste management:

Warren county dumping: https://timeline.com/warren-county-dumping-race-4d8fe8de06cb

Seneca meadows landfill: https://www.wxxinews.org/post/protests-continue-over-seneca-meadows-landfill

Who pays for the cleanup of toxic sites: https://www.njspotlight.com/2020/04/after-40-years-superfund-program-in-nj-is-still-work-in-progress/

Waste management systems (general):

Metro central: https://www.oregonmetro.gov/news/right-sort-trash-metro-central-makes-most-waste

Importance in compact equipment: https://www.norcalcompactors.net/compaction-equipment-in-todays-world-and-its-importance/

Sustainable materials management: https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management-hierarchy#Treatment

Waste-to-energy systems:

Waste-to-energy: https://www.eia.gov/energyexplained/biomass/waste-to-energy-in-depth.php

Refuse derived fuel: https://www.sciencedirect.com/topics/engineering/refuse-derived-fuel

Recycling:

Material recovery facility: https://www.dakotavalleyrecycling.org/other-residential-recycling/330-how-a-materials-recovery-facilities-works

Hazardous waste disposal:

Hazardous waste disposal: https://www.oregonmetro.gov/tools-working/guide-small-business-hazardous-waste-disposal/

Landfill science:

Inside a landfill: https://www.livescience.com/32786-what-happens-inside-a-landfill.html

Landfill as museums: https://slowfactory.foundation/landfills-as-museums

Landfills: https://science.howstuffworks.com/environmental/green-science/landfill6.htm

Bio- energy: https://sites.google.com/site/alternativeenergyg6/bio-energy

Food waste and composting:

Food waste from *The Washington Post:* https://www.washingtonpost.com/news/wonk/wp/2014/09/23/americans-throw-out-more-food-than-plastic-paper-metal-or-glass/?utm_term=.0b5a9264a6404

Banana peel: https://wealthfromwaste.wordpress.com/tag/banana-peel/

Composting with kitchen scraps: https://sjcmastergardeners.wordpress.com/2014/03/16/composting-with-kitchen-scraps-a-primer/

1 min virtual tour of the Recology compost facility: https://youtu.be/yoOKrHZpewc

Treatment of animal waste:

Anaerobic digestion: https://www.epa.gov/agstar/how-does-anaerobic-digestion-work

Turning manure into profit: https://www.worldwildlife.org/blogs/sustainability-works/posts/the-biogas-solution-turning-manure-into-profit

Put dog poop to use: https://interestingengineering.com/inventor-develops-system-that-powers-a-street-light-with-10-bags-of-dog-poo-for-2-hours

Disposing of dog poop: https://brightly.eco/best-way-dispose-dog-poop/

Treatment of human waste:

The path of human waste: https://www.livescience.com/where-does-poop-go.html

Wastewater as an energy source: https://www.wri.org/insights/wastewater-best-hidden-energy-source-youve-never-heard

Untreated sewage used to generate power: https://www.eenewseurope.com/news/project-generates-power-sewage

Wastewater treatment: https://www.conserve-energy-future.com/process-of-wastewater-treatment.php

EPA septic systems overview: https://www.epa.gov/septic/septic-systems-overview

Put human waste to use: https://www.engineeringforchange.org/news/10-ways-to-put-human-waste-to-use/

Brownfields:

The politics of redeveloping brownfields and abandoned property: https://www.naco.org/sites/default/files/documents/SLU_Report%20-%20The%20Politics%20of%20Redeveloping%20Brownfields%20and%20Abandoned%20Property.pdf

Brownfields benefits of reuse: https://dec.alaska.gov/spar/csp/brownfields/benefits-of-reuse/

Environmental contaminants often found at brownfield sites: https://www.epa.gov/sites/default/files/2019-10/documents/environmental_contaminants_often_found_at_brownfield_sites.pdf

Environmental Protection Agency brownfields overview: https://www.epa.gov/brownfields/overview-epas-brownfields-program