Plastic Degradation with Worms

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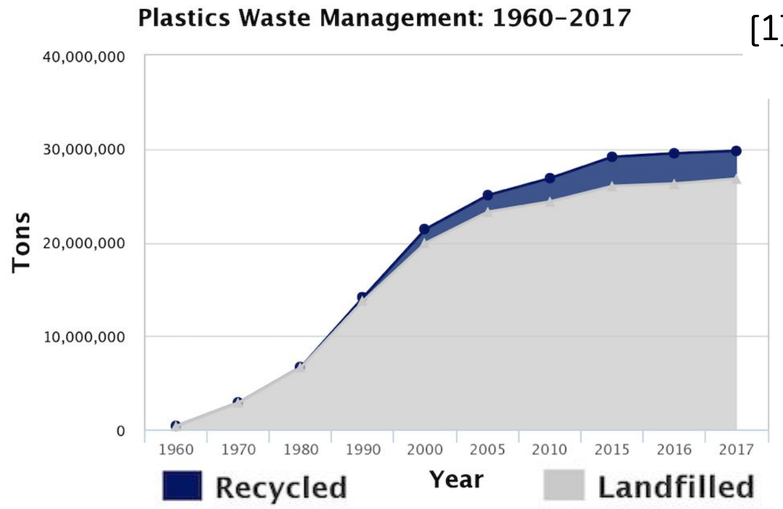
PURPOSE

- Uncover **alternative biodegradation methods** for currently non-biodegradable plastics
- Identify how to make **alternative biodegradation methods more effective**
- Use research to **improve outcomes of world's plastic problem**

BACKGROUND

- 6.3 billion tons produced over the world in 2015
- only 21% of the plastic was recycled or incinerated
- microplastics make up 92.4% of plastic waste
- plastic pollution affects organisms, soil, and water
- 80% of plastics are non biodegradable



[1]

PROPOSED METHODS

- Mealworms, earthworms, and superworms can all degrade non biodegradable plastics
- We will measure the levels of biodegradation of these species under varying conditions: different temperatures, nutrient levels, pHs
- We will measure plastic in each of the worm & condition combinations each week for eight weeks

EXPECTED OUTCOMES

- Create graphs showing plastic degradation with each worm & condition
- Compare graphs to see which worm species was most effective at plastic degradation under which conditions
  - Example outcome: Mealworms degrade plastic the best a higher temperatures, while the other two are not impacted by temperature

CONCLUSION

- Mealworms, earthworms, and superworms are to be used as a method to elucidate alternative biodegradation methods which can be used at a large scale
- After experimnetation, mathematical modeling will be used to determine which worm under which condition is able to biodegrade plastic at the highest efficiency

REFERENCES

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