Waste on Nantucket: Study & Outreach

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Worcester Polytechnic Institute

Nantucket DPW
Graeme Durovich and Rob McNeil
Objective

Perform a waste characterization and create strategies to reduce the waste entering the landfill.
What is a Waste Characterization Study?

Planning Phase  Action Phase  Analysis Phase
During the planning phase, we spent seven weeks becoming trash experts.

- Researched the history, economics, politics, and science of waste
- Looked into different methodologies from other waste characterizations
- Compared findings with Nantucket specific considerations
Determining Details of the Sort

Sample Preparation
- 200 bags to be sorted
  - 100 from drop off
  - 100 from commercial hauler

Sort Roles
- Job list used to manage tasks
  - Sorters, Recorders, Weighers, Cleaners, etc.

Categories
- 8 categories and 18 sub-categories
  - Examples: Glass, Plastic, Organics, Paper, Metal

Scheduling
- The sort would take place on October 29th
  - Arrive at 7, work till 3:30
Materials Recovery Facility

Requires items to be sorted into plastics, tin/aluminum, glass, corrugated cardboard and Household waste.

Commercial Hauler

Requires items to be sorted into plastics and tin/aluminum recyclables, Glass, and Household Waste.
Plastic
Corrugated Cardboard
Tin/Aluminum

Household Waste

Waste Characterization
The action phase was an unforgettable experience.
The Nantucket waste system is complex.

- Recyclables: 369 tons
- Plastic, Tin/Aluminum, Cardboard: 225 tons
- Compost: 582 tons
- Landfill: 301 tons
- Municipal Solid Waste: 883 tons
- Glass: 144 tons

DPW intake facility total: 1,252 tons
Our raw data contained many nuances.

<table>
<thead>
<tr>
<th>General Category</th>
<th>Sub-Category</th>
<th>Total Wt (lb)</th>
<th>Wt % of Total</th>
<th>Total Month Oct 2018 (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper</td>
<td>Paper and Cardboard</td>
<td>429</td>
<td>24%</td>
<td>169</td>
</tr>
<tr>
<td>Paper</td>
<td>Waxed Paper</td>
<td>30</td>
<td>2%</td>
<td>12</td>
</tr>
<tr>
<td>Paper</td>
<td>Corrugated Cardboard</td>
<td>79</td>
<td>4%</td>
<td>31</td>
</tr>
<tr>
<td>Organics</td>
<td>Compostable Organics</td>
<td>668</td>
<td>37%</td>
<td>263</td>
</tr>
<tr>
<td>Organics</td>
<td>Non-Compostable Organics</td>
<td>55</td>
<td>3%</td>
<td>21</td>
</tr>
<tr>
<td>Plastic</td>
<td>Non-recyclable plastics</td>
<td>158</td>
<td>9%</td>
<td>62</td>
</tr>
<tr>
<td>Plastic</td>
<td>Recyclable plastics</td>
<td>43</td>
<td>2%</td>
<td>17</td>
</tr>
<tr>
<td>Plastic</td>
<td>2020-Ban plastics</td>
<td>12</td>
<td>1%</td>
<td>5</td>
</tr>
<tr>
<td>Plastic</td>
<td>Films</td>
<td>93</td>
<td>5%</td>
<td>37</td>
</tr>
<tr>
<td>Plastic</td>
<td>Styrofoam</td>
<td>22</td>
<td>1%</td>
<td>9</td>
</tr>
<tr>
<td>Other Waste</td>
<td>Textiles</td>
<td>49</td>
<td>3%</td>
<td>19</td>
</tr>
<tr>
<td>Other Waste</td>
<td>Other materials</td>
<td>-</td>
<td>0%</td>
<td>-</td>
</tr>
<tr>
<td>Metal</td>
<td>Tin/alluminum</td>
<td>64</td>
<td>4%</td>
<td>25</td>
</tr>
<tr>
<td>Metal</td>
<td>Other metals</td>
<td>14</td>
<td>1%</td>
<td>5</td>
</tr>
<tr>
<td>Glass</td>
<td>Bottles/Jars</td>
<td>53</td>
<td>3%</td>
<td>21</td>
</tr>
<tr>
<td>Glass</td>
<td>Other Glass</td>
<td>4</td>
<td>0%</td>
<td>2</td>
</tr>
<tr>
<td>Electronics</td>
<td>Electronics</td>
<td>11</td>
<td>1%</td>
<td>4</td>
</tr>
<tr>
<td>Bulky Materials</td>
<td>Bulky Materials</td>
<td>-</td>
<td>0%</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Samples</strong></td>
<td></td>
<td><strong>1,781</strong></td>
<td><strong>100%</strong></td>
<td><strong>702</strong></td>
</tr>
</tbody>
</table>
1,781 lbs of trash have been sorted in our waste characterization. That's about 400 people's daily trash output!
702 tons of waste was generated during October 2018 (that’s about as heavy as 6 blue whales)
DIVERTIBLE WASTE

Waste that can be diverted from the landfill by being recycled or composted.
COMPOSTABLE VS. NON-COMPOSTABLE

<table>
<thead>
<tr>
<th>Compostable</th>
<th>Non-Compostable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper</td>
<td>Everything else</td>
</tr>
<tr>
<td>Food waste</td>
<td></td>
</tr>
</tbody>
</table>
## Non-Divertible Waste

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Recyclable Plastics</td>
<td>9%</td>
</tr>
<tr>
<td>Films</td>
<td>5%</td>
</tr>
<tr>
<td>Non-Compostable Organics</td>
<td>3%</td>
</tr>
</tbody>
</table>

## Divertible Waste

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tin/Aluminum</td>
<td>4%</td>
</tr>
<tr>
<td>Textiles</td>
<td>3%</td>
</tr>
<tr>
<td>Bottles/Jars</td>
<td>3%</td>
</tr>
<tr>
<td>Recyclable Plastics</td>
<td>2%</td>
</tr>
</tbody>
</table>
DIVERTIBLE VS NON-DIVERTIBLE WASTE

Non-Divertable 17%

Divertable 83%

Non-Divertible
- Non-Compostable Organics
- Films
- Non-Recyclable Plastics

Divertible
- Recyclables
- Textiles
- Compostable Material
Conveying this kind of information takes some trial and error.
Conveying this kind of information takes some trial and error.
Conveying this kind of information takes some trial and error.
# NANTUCKET: WE RECYCLE LIKE NOBODY ELSE.

It’s very important to Nantucket as a unique island community to maintain the island’s health and beauty. Here on the island, we use a special biodigester to break down organics from household waste and turn them into reusable soil. We all love Nantucket, so we recycle and use our biodigester as much as possible!

## AT THE LANDFILL WHERE DOES IT GO?

<table>
<thead>
<tr>
<th>1 PLASTICS ALL PLASTICS including common recyclables: bottle caps, plastic bags, and films.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 TIN/ALUMINUM Tin and aluminum items including beverage cans, soup cans, lids, and bottle caps.</td>
</tr>
<tr>
<td>3 GLASS Glass containers such as bottles and jars of all colors.</td>
</tr>
<tr>
<td>4 CORRUGATED CARDBOARD ONLY double-walled, corrugated cardboard, shipping boxes, for recycling.</td>
</tr>
<tr>
<td>5 ORGANICS Food waste and paper products including non-corrugated cardboard and pizza boxes.</td>
</tr>
</tbody>
</table>

**REMEMBER:**
- If it's going in the recycling, it needs to be clean and free of food waste or other contaminants. Otherwise, it may not actually be recycled.
- Using clear garbage bags is a requirement on the island.
- **YOU can make a difference!**

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# OTHER MATERIALS

<table>
<thead>
<tr>
<th>Yard Waste and Brush</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yard waste such as leaves and trimmings can be disposed of at the landfill for free. Brush, such as logs and tree branches, can be disposed of at the landfill for a fee.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bulky Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items such as appliances, mattresses, smoke detectors, and alkaline batteries can be disposed of at the landfill.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazardous Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are six (6) Household &amp; Commercial Hazardous Waste collection events per year. Items that may be collected during these events include:</td>
</tr>
</tbody>
</table>

**NANTUCKET HOUSEHOLD & COMMERCIAL HAZARDOUS WASTE COLLECTION DAY**

- AUTOMOTIVE PRODUCTS: Antifreeze, Brake Fluids, Motor Oil, Oil Filters, Transmission Fluid, Solvents.
- CLEANING PRODUCTS: Bathroom Cleaner, Drain Opener, Furniture Polish, Metal Polish, Oven Cleaner.
- PAINT & PAINT PRODUCTS: Adhesives, Aerosol Cans (not empty), Epoxies, Paint, Paint Thinner, Paint Remover, Stains, Varnishes. NO LATEX PAINT.
- PESTICIDES: Fertilizer (with Weed Killer), Fungicides, Herbicides, Insecticides, Rod Poisons, Weed Killer.
- OTHER PRODUCTS: Asbestos*, Batteries (Mercury and Lithium), Driveway Sealer, Gasoline, Mercury (Florescent Bulbs), Pool Chemicals, Photography (Chemicals), Fire Extinguishers and Aerosol Cans that have had their propellants removed.

**Not collected at the landfill:**

- SYRINGES and other sharps can be taken into the Nantucket Fire Department. Please contact them at (508) 228-2323.
- MEDICATION can be disposed of at local retail pharmacies during sanctioned and scheduled “Take-Back Days.”
- Harbor Fuel takes HOME HEATING OIL TANKS for a fee. Please contact them at (508) 228-2750.
- PROPANE TANKS for grills can be taken to Yates Gas. Please contact them at (508) 228-0732.
- For AMMUNITION and EXPLOSIVES please contact the Nantucket Public Safety Facility at (508) 228-1272.
- LATEX PAINT is non-hazardous and will not be accepted. Mix the can of latex paint with kitty litter, let harden and dispose of cans at the landfill in the metal bin.

For more information, visit **www.nantucketrecycles.com** or call Waste Options at (508) 228-4823. The Nantucket Landfill is located at 153 Mandy Lane.
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**REMEMBER!**

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**OTHER MATERIALS**

**Yard Waste and Brush**
Yard waste such as leaves and trimmings can be disposed of at the landfill for free. Brush, such as logs and tree branches, can be disposed of at the landfill for a fee.

**PESTICIDES**: Fertilizer (with Weed Killer), Fungicides, Herbicides, Insecticides, Rat Poisons, Weed Killer.

**OTHER PRODUCTS**: Asbestos*, Batteries (Mercury and Lithium), Driveway Sealer, Gasoline, Mercury (Florescent Bulbs), Pool Chemicals, Photography (Chemicals), Fire Extinguishers and Aerosol Cans that contain Freon.

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**Not collected at the landfill:**

- **Syringes** and other sharps can be taken into the Nantucket Fire Department. Please contact them at (508) 228-2323.
- **Medications** can be disposed of at local retail pharmacies during sanctioned and scheduled “Take-Back Days.”
- Harbor Fuel takes HOME HEATING OIL TANKS for a fee. Please contact them at (508) 228-2790.
- PROPANE TANKS for grills can be taken to Yates Gas. Please contact them at (508) 228-0725.
- For AMMUNITION and EXPLOSIVES please contact the Nantucket Public Safety Facility at (508) 228-1372.
- LATEX PAINT is non-hazardous and will not be accepted. Mix the can of latex paint with kitty litter, let harden and dispose of cans at the landfill in the metal bin.

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For more information, visit www.nantucketrecycles.org. Call Waste Options at (508) 228-4283. The Nantucket Landfill is located at finance Rd.
NANTUCKET: WE RECYCLE LIKE NOBODY ELSE.

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Not collected at the landfill:

Syringes and other sharps can be taken into the Nantucket Fire Department. Please contact them at (508) 228-2323.

Medication can be disposed of at local retail pharmacies during sanctioned and scheduled “Take-Back Days.”

Harbor Fuel takes HOME HEATING OIL TANKS for a fee. Please contact them at (508) 228-2950.

PROpane tanks for grills can be taken to Yates Gas. Please contact them at (508) 228-0725.

For AMMUNITION and EXPLOSIVES please contact the Nantucket Public Safety Facility at (508) 228-1212.

LATEX PAINT is non-hazardous and will not be accepted. Mix the can of latex paint with kitty litter, let harden and dispose of cans at the landfill in the metal bin.

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★ YOU can make a difference!
Conducting a Waste Characterization on Nantucket

A How-to Guide
The guide provides a structure for conducting a waste characterization study for any place interested.

- **Planning**
  - Categories
  - Planning the Details
  - Choosing the Location

- **Action**
  - Conducting the Sort
  - Data Collecting
  - Reflections

- **Analysis**
  - Spreadsheets
  - Messaging
  - Outreach
The guide will ensure a baseline for the waste characterization process, while allowing the process to evolve for future needs.
Acknowledgements

- Advisors Scott Jiusto and Fred Looft
- Nantucket DPW
- Graeme Durovich
- Robert McNeil
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- Stubby’s
- Remain Nantucket
- The Shipwreck Museum Folks
- Nantucket Yacht Club
- Harvey, Vin and Peter
Thank you!