

Climate on Tap

'What is the Carbon Footprint of Recycling?'

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List the following recyclables in order of the amount of CO₂ produced to recycle them ...



Mixed Paper

Metal cans:
Aluminum
Steel (Tin)



Plastic bottles
and jugs

Glass



Cardboard



Share your thoughts with those at your table.

What will be covered today:



- What is the carbon footprint of various recycling commodities?
- How did we get into this mess?
- Why is it so difficult to know what to recycle?
- Where does our recycling go and what does it become?

Tons of Greenhouse Gas Reduction

Measured as the total metric tons of CO₂ reduction in 2020 caused by recycling vs. landfilling

Least
CO₂
↑
↓
Most
CO₂

Cardboard
Mixed Paper (residential)
Aluminum Cans
Glass
Steel Cans
Mixed Paper (offices)
Mixed Plastics

For
Jefferson
County

Cardboard



Cardboard boxes can be recycled at least seven times and can be used to make new packaging boxes and even furniture.

1. Recycling cardboard only takes **75% of the energy** required to make new cardboard
2. Over **90%** of all products shipped in the U.S. are packaged in corrugated boxes
3. Approximately **100 billion cardboard boxes** are produced each year in the U.S.
4. One ton of recycled cardboard saves **46 gallons of oil**
5. **One ton of recycled cardboard** saves 9 cubic yards of landfill space

Mixed Paper

Recycling paper uses more fossil fuels than virgin paper. But a switch to renewable energy and better wastepaper disposal practices could drastically cut carbon emissions.



Metric tons by 2050

- Business as usual 736
- Capturing methane in the landfill 591
- Using renewable energy 28!

Fun Facts about Paper Recycling!

- Manufacturing one ton of office and computer paper with recycled paper stock can save nearly **3,000 kilowatt hours** over the same ton of paper made with virgin wood products.
(3,000 kw hours = 500 hours or 21 days running your hot water heater)
- Americans use **85 million tons** of paper per year which is about **680 pounds** per person
- **70%** of the total waste in offices is paper waste
- Recycling one ton of paper saves **7,000 gallons** of water
- The average office worker uses **10,000 sheets** of paper per year
- Recycling a stack of newspaper just 3 feet high **saves one tree**
- Approximately **1 billion trees** worth of paper are thrown away every year in the U.S.

Each ton of recycled paper can save 17 trees



40% of landfill is waste paper!



Aluminum Cans



How long does it take for an aluminum can to be recycled into a new one and put back on the grocery shelf?

Just 60 days!!

Recycling one aluminum can saves enough energy to run a **55-inch HDTV to watch your favorite movie.**

If we recycled all of the aluminum cans in the U.S., the energy saved could power **4.1 million homes** for a full year.

The average person has the opportunity to recycle more than **25,000 cans** in their life

Aluminum can be **recycled forever** without any loss of quality

Aluminum can be recycled using only **5% of the energy** used to make the product from new materials

Glass



For every **six tons of recycled container glass** used in manufacturing, we can **reduce one ton of carbon dioxide emissions**.

If you **recycle one glass bottle**, it saves enough energy to light a **100-watt bulb for four hours**, power a computer for 30 minutes, or a television for 20 minutes.

Glass is **100% recyclable and can be recycled endlessly** without loss in quality or purity

More than **28 billion** glass bottles and jars go to landfills every year. That's enough to fill two Empire State Buildings every three weeks

Steel Cans



The United States annually recycles enough iron and steel scrap metals, by weight, to **build more than 900 Golden Gate Bridges** — a bridge stretching nearly 9,000 feet.



They can be melted down into lots of products like **more cans, re-bar, bicycle frames, car parts, appliances, and even paper clips.**



Plastic

Only 23% of disposable water bottles are recycled

2.5 million plastic bottles are thrown away **every hour** in America

Recycling plastic takes **88% less energy** than making it from raw materials

Plastic bags can take up to **1,000 years** to decompose

Recycling one ton of plastic saves the equivalent of **1,000-2,000 gallons** of gasoline

Recycling plastic saves **twice as much energy** as burning it in an incinerator

Recycling **one ton** of plastic bottles saves the equivalent **energy usage** of a two person household for one year

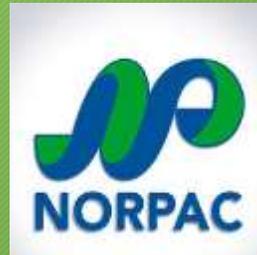


Where does Jefferson County's recycling go?





... works hard to find nearby reliable markets for our recycling, saving us money, precious resources, and reduces our carbon footprint!

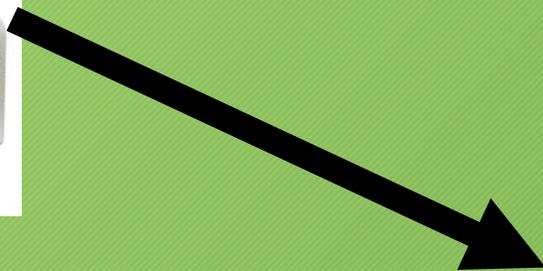


Longview, WA

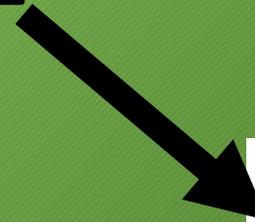
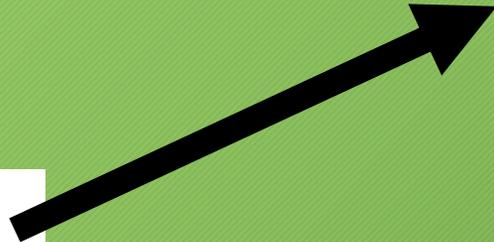




Seattle, WA



Tacoma, WA



Where does our trash go?





COMPOSTABLES
39%

**PROBLEM MATERIALS
(GARBAGE)**
29%



RECYCLABLES
32%

The 'single stream' recycling dilemma

- Waste haulers found it was a more efficient system than 'source separation'.
- More people recycled, but the recycling was more contaminated
- Giant Materials Recovery Facilities (MRFs) were built



The 'single stream' recycling dilemma

- Waste haulers found it was a more efficient system than 'source separation'.
- More people recycled, but the recycling was more contaminated
- Giant Materials Recovery Facilities (MRFs) were built
- Contamination rate is still high
 - Single stream recyclables = up to 40% becomes garbage
 - Source separated recyclables = 2-5% becomes garbage

Plastic bags and film



Plastic bags & film can be
dropped off at these locations:





Does this information provide you with any insights into actions people can take to make a difference?

Chat at your tables and then share some of your insights and ideas with the group!



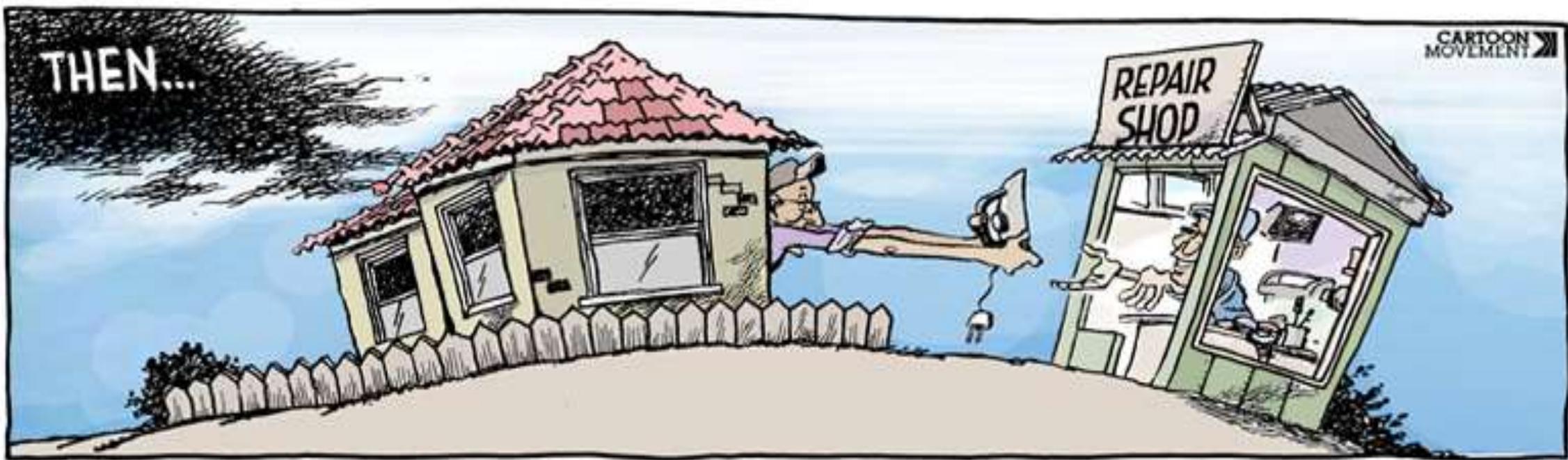
The problem with plastic ...





THEN...

CARTOON
MOVEMENT



NOW...



66 million TONS!



Our dirty little secret ...



China has tried to address this problem for years

- “Green Fence” in 2013
- “National Sword” in 2017
- “Blue Skies 2018”



In January 2022, the U.S. exported a total of 38,449 tons of plastic waste

16,946 tons (44%) going to non-OECD countries:

- Malaysia (5,397 tons)
- India (2,939 tons)
- Vietnam (1,983 tons)
- Indonesia (2,188 tons)

U.S. plastic waste exports to Latin America:

- Mexico (6,891 tons)
- El Salvador (1,314 tons)
- Ecuador (582 tons)



Some historical context ...

- Numbers with arrows were invented by the plastics industry in the 80's to indicate the main type of plastic in the item
- They were incorporated before there were factories that could recycle them. It was simply 'greenwashing'
- Only #1 and #2 bottles and jugs have any real value in today's market

 PETE	Polyethylene Terephthalate Ethylene PETE goes into soft drink, juice, water, detergent, and cleaner bottles. Also used for cooking and peanut butter jars.
 HDPE	High Density Polyethylene High Density Polyethylene HDPE goes into milk and water jugs, bleach bottles, detergent bottles, shampoo bottles, plastic bags and grocery sacks, motor oil bottles, household cleaners, and butter tubs.
 PVC	Polyvinyl Chloride PVC goes into window cleaner, cooking oil, and detergent bottles. Also used for peanut butter jars and water jugs.
 LDPE	Low Density Polyethylene LDPE goes into plastic bags and grocery sacks, dry cleaning bags, flexible film packaging, and some bottles.
 PP	Polypropylene PP goes into caps, disks, syrup bottles, yogurt tubs, straws, and film packaging.
 PS	Polystyrene PS goes into meat trays, egg cartons, plates, cutlery, carry-out containers, and clear trays.
 OTHER	Other Includes resins not mentioned above or combinations of plastics.

Recycling plastic in Jefferson County ... a brief history



We only take plastic #1s and #2s

We only take plastic
bottles and jugs

“our recycling must be handled in an environmentally and socially responsible way.”



This
changed in
2015

We added #5's: dairy tubs, plant pots, and buckets





These go in the RECYCLING BINS!



Mixed Paper	Plastic & Cans	Glass
newspaper mail, catalogs, mixed paper paper bags toilet paper rolls magazines phone books Paper boxes from cereal, shoes, eggs, toothpaste, etc.	<p>NEW!</p> plastic tubs: dairy, margarine, salsa, etc.	<u>clear, brown and green</u> glass bottles & jars no <u>blue</u> glass; no <u>lids</u> ; labels OK
<p>NOW recycling plastic by type not number</p>	<p>NEW!</p> buckets limit of 3	metal cans NO lids clean aluminum cans, pans & foil
	<p>NEW!</p> plant pots rigid plastic only; 12" max	bottles & jugs
<h3>Unwaxed Cardboard</h3> <p>For all: flatten Curbside service: bundle & tie</p>	<p>PREP for all plastic, cans & glass: rinse and empty</p> <p>Prevent contamination: all items in bins must be loose</p> <p>NO items in plastic bags, paper bags or boxes; NO food</p>	

These go in the TRASH!



Miscellaneous paper & plastic:

- food-contaminated paper
- juice cartons
- pet food bags
- Tetra-paks
- plastic silverware, cups and lids
- milk cartons
- plastic bags
- waxed cardboard
- used paper coffee cups

ANY of these will contaminate **ALL** the recycled glass in the bin:





30 to 60%
contamination!!



I do remember,
and then
when I try
to remember,
I forget.



Recycling in Jefferson County



Keep it **CLEAN** and **EMPTY**
to keep it **RECYCLABLE!**

Please Place in the **TRASH** - they will **CONTAMINATE** the recycling!



When in doubt, throw it out.

Place in **RECYCLING BINS**

NO LIDS, except over 3"

Mixed Paper



Plastic & Cans



Glass



Unwaxed Cardboard



Place *clean and empty* recyclables **loose** in bins. Please don't place bagged or boxed recyclables in bins.

Appendix F: Contamination Reduction and Outreach Plan

Introduction

RCW 70.205.045 requires that each county and city comprehensive solid waste management plan includes a contamination reduction and outreach plan (CROP) that addresses reducing the contamination of materials accepted as part of the recycling program.

RCW 70.205.045 requires that the CROP includes:

- Identifying key contaminants and their financial and other impacts on the collection system
- A list of actions for reducing contamination
- A schedule and details on how outreach will be conducted

These requirements follow from China's 2018 closure of what was the largest market for recyclable materials from the U.S. due to a high contamination rate.

This CROP is made part of the SWMP as **Appendix F: Recycling Contamination Reduction and Outreach Plan**. It is a working document and will be revised over time as necessary to keep it current. SWAC will assist staff in incorporating the CROP into the SWMP as part of the revisions scheduled for 2022.



What to Recycle

Starts April 1, 2022!

Glass



Clean bottles and jars
ONLY
Labels OK

NO lids
NO blue glass
NO other glass
NO dirty containers!



Plastic and Cans



ONLY bottles and jugs
NO lids
NO other plastics!

*see back page for more info

Metal cans
NO loose lids

Plastic bottles for motor oil, antifreeze, weed killer, etc. go in the trash.

Recycling **MUST BE** rinsed thoroughly, empty, and loose in the bins—not bagged!

Corrugated Cardboard




Look for the wavy lines

CLEAN CORRUGATED CARDBOARD
NO food, wax or plastic coating

Curbside service: bundle & tie
For all: flatten



Mixed Paper



Boxes, paper bags, newspaper, magazines, office paper, junk mail

If it's not on this list, we can't recycle it!
No "wish cycling" please!

“Wish Cycling”

Then an elf takes it to a magical place ...



“If I put this item that is not on the list in the bin, it will become something wonderful!”



Where a fairy turns it into something useful!

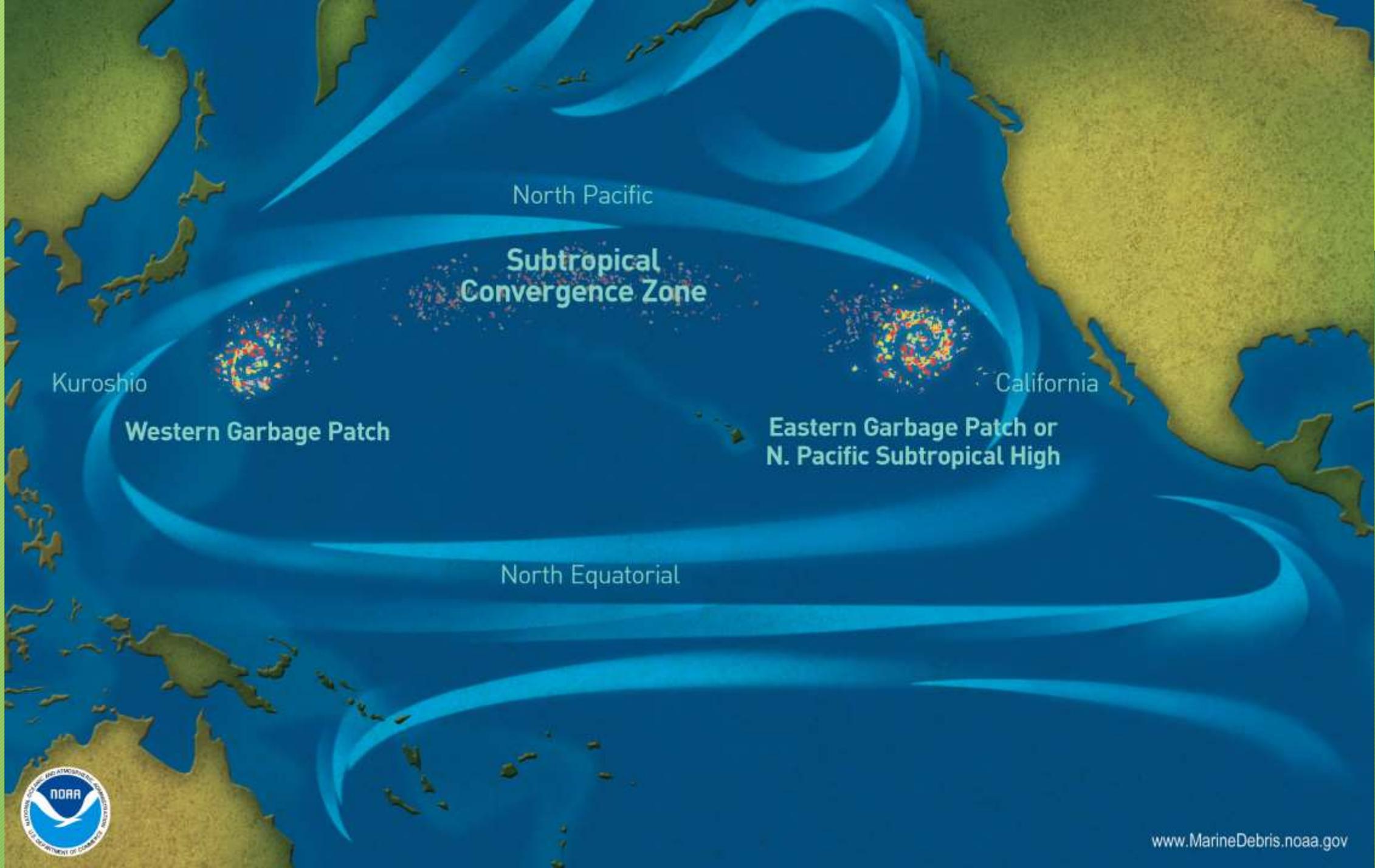


Here are four things that can happen when you *wish cycle* instead of *recycle*:

- It takes longer to sort recycling, which costs recycling programs more money.
- Items that are recyclable, but not through your curbside pickup – such as electronics – never get recycled. Instead, they end up in landfills.
- Other items that are recyclable, but not through your curbside pickup – such as plastic bags and extension cords – jam and damage sorting machinery.
- Recycling is most economical when people recycle only clean materials that can be sold to make new goods. So when we recycle only what is accepted, it keeps down the cost to run our recycling program.

Why are plastics a problem?





North Pacific

**Subtropical
Convergence Zone**

Kuroshio

Western Garbage Patch

California

**Eastern Garbage Patch or
N. Pacific Subtropical High**

North Equatorial



• There is an estimated 200 million tons of plastic littering our oceans.

• The majority of this plastic debris ultimately finds its way to one of these massive swirling gyres.

• The largest of the oceanic gyres is the Great Pacific Garbage Patch.

• In parts of the Great Pacific Garbage Patch, there are over 2 million pieces of plastic per square mile of ocean.

• While plastic is not biodegradable, it is photodegradable. Sunlight breaks it down into ever-smaller pieces known as microplastics.

• Over 90% of plastic pollution is made up of microplastics smaller than your fingernail.

• These microplastics often absorb highly toxic chemicals like DDT & PCB.

• Unable to distinguish microplastics from food, many animals starve to death, their bellies choked with plastic; others survive just long enough to contaminate our food chain

• Hindered by a stale way of thinking, gyre cleanup has been virtually nonexistent. Thanks to recent innovations in science and technology, hope is on the horizon.

• Our oceans could well be void of life within the next two generations if nothing is done to stem this.

GREAT PACIFIC GARBAGE PATCH

WEST PACIFIC GYRE

EAST PACIFIC GYRE

NORTH ATLANTIC GYRE

SOUTH ATLANTIC GYRE

INDIAN OCEAN GYRE

SOUTH PACIFIC GYRE

DECOMPOSITION RATES

Bananna peel:	2-3 wks
Paper:	5-10 wks
Cigarette butt:	10-15 yrs
Aluminum can:	200-500 yrs
Glass bottle:	1,000,000 yrs
Styrofoam:	never *
Plastic bottle:	never *
Fishing line:	never *
Plastic bag:	never *

* Plastic is not biodegradable

Plastic is FOREVER!



LARGER PLASTIC PRODUCTS



UV

WAVE ACTION

CLOTHING



FIBRES



NURDLES



Small plastic pellets used in industry

PERSONAL HYGIENE PRODUCTS



Toothpaste, shower gel, facewash

MICROBEADS



MICROPLASTIC



Every week!

Every year!



Every decade!
40 pounds!

Negative health effects from plastics



Inverted Waste Pyramid

REFUSE

REDUCE

REUSE

ROT

RECYCLE

LANDFILL

Most desirable



Least desirable



Inverted Waste Pyramid

REFUSE

REDUCE

REUSE

ROT

RECYCLE

LANDFILL



Some things to ponder ...

- Fracking has caused the plastics boom
- 99% of plastic is fossil fuel
- Of all the plastic ever made, half was made in the **past 15 years**

Plastic facts: 84% is never recycled

12% is incinerated

32% is litter

40% landfill

14% “downcycled”

2% effectively recycled

What can we do to stay in the top layers?



Inverted Waste Pyramid



Climate on Tap

Thank you for coming!
Questions?

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