

Where is All This Trash Coming From?

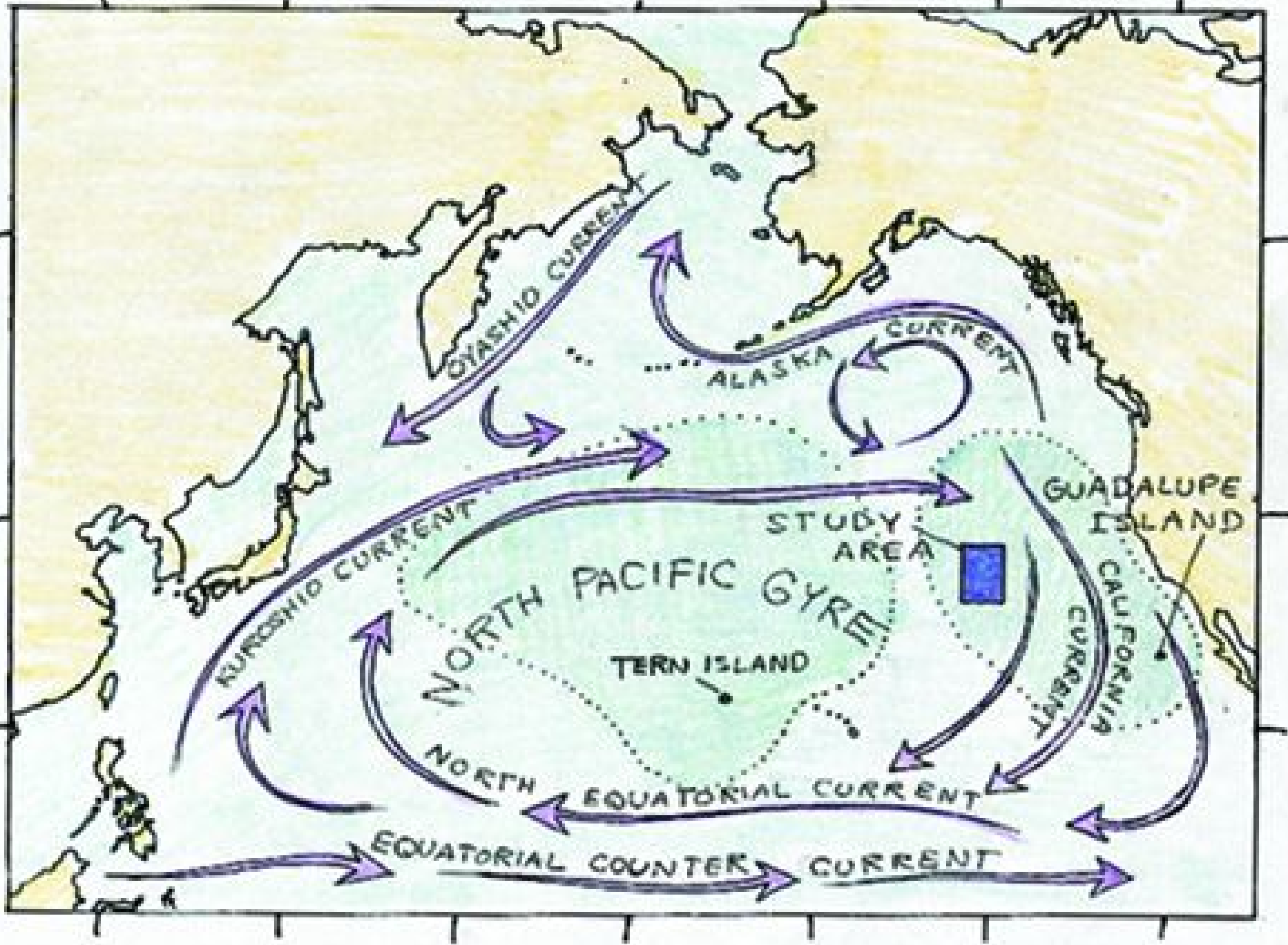
Land-based Sources of Marine Debris



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Is the Garbage Patch Growing?

- In all gyres, density of plastic particles increases closer to center.
- In North Pacific Gyre: number of plastic particles on surface increased over 1,000% between 1972-2010.
- In North Atlantic, 130,000 plastic pieces/KM². Highest sampling showed 26.3 million pieces/KM².

Is the Garbage Patch Growing?

- In shipping lanes between Iceland and Scotland, 3 times more plastic in the water column in the 1990s compared with the 1960s
- In Southern Atlantic Ocean, quantity of debris increased 100 times in the early 1990s
- In coastal areas of Japan, from the 1970s to the 1980s, marine plastic particle densities increased ten fold in 10 years
- In the 1990s in Japan, densities appear to have increased tenfold every 2-3 years

Marine Debris – What is it?

- Marine Debris – “Any manufactured or processed solid waste material that enters the marine environment from any source.”
- Debris is everywhere – found around every major body of water on the planet, and below water as well.
- Marine Debris is a global pollution problem that impacts human health and safety, endangers wildlife and aquatic habitats, and costs local & national economies millions in wasted resources and lost revenues.

Marine Debris Sources

- Storm water discharges
- Combined sewer overflows
- Beach visitors
- Ships and other vessels
- Solid waste disposal and landfills materials such as garbage and medical waste
- Offshore oil platforms
- Industrial activities
- Illegal dumping or littering

Approximately 20% comes from ocean-based sources:

- Commercial fishing vessels
- Cargo ships (discharge of containers and garbage)
- Pleasure cruise ships







Approximately 80% comes from land-based sources:

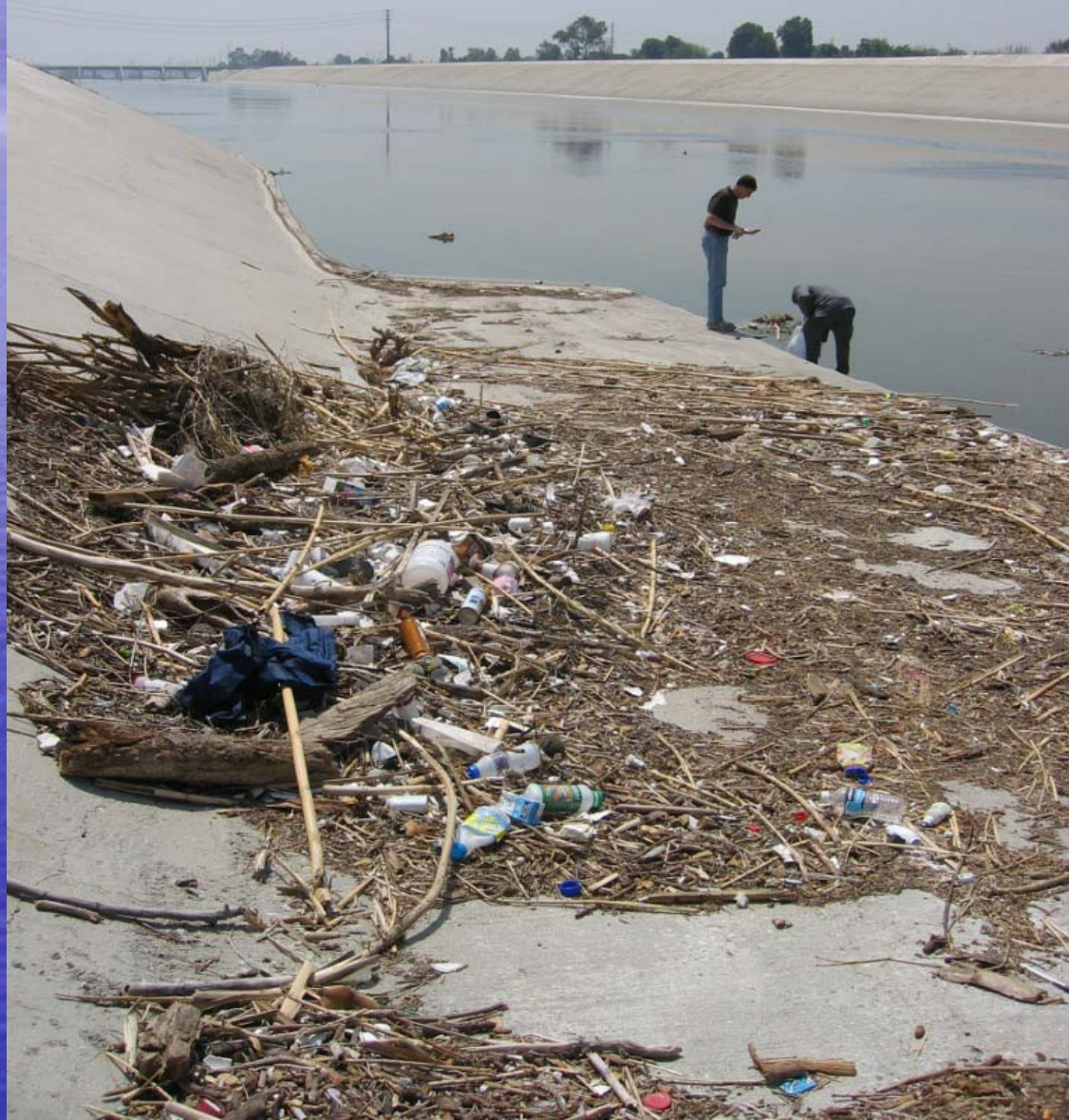
- Litter (pedestrians, motorists, beach visitors)
- Industrial discharges (pellets and powders)
- Garbage management (containers, trucks, landfills)



Los Angeles River



Los Angeles River



Ballona Creek



Industrial Discharges











Marine Debris Composition

- Shoreline Debris:

- Between 60 – 80 percent comes from inland sources (including stormwater discharge, beach visitors, and non-point source pollution.)
- 60 percent of shoreline debris is composed of plastic.

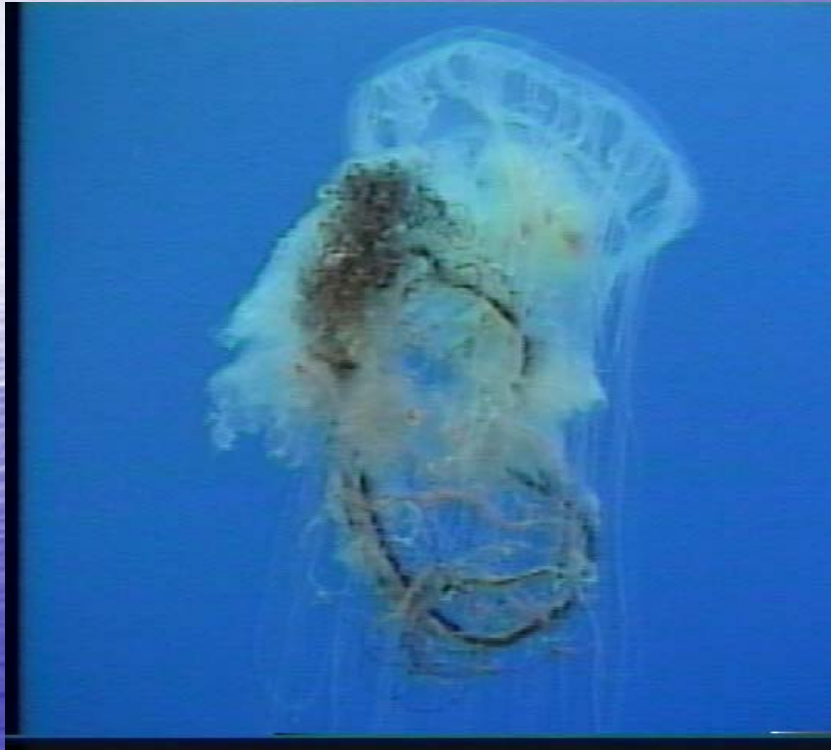
Item	Amount	Percent
Cigarettes/Cigarette Filters	335,320	37.84%
Food Wrappers/Containers	124,637	14.07%
Bags (Plastic)	65,736	7.42%
Caps, Lids	64,517	7.28%
Cups, Plates, Forks, Knives, Spoons	39,254	4.43%
Straws, Stirrers	32,124	3.63%
Bags (Paper)	29,269	3.30%
Glass Beverage Bottles	27,292	3.08%
Beverage Bottles (plastic) 2 liters or less	25,773	2.91%
Beverage Cans	22,041	2.49%
Top Ten Total	765,963	86.44%

* Statistics from 2010 California Coastal Cleanup Day

Marine Debris Composition

- Ocean Debris:
 - Plastic accounts for over 3/4 of all debris found in the marine environment
 - 90% of floating litter is plastic
 - Plastic is prevalent in at all depths, from the surface of the ocean through the water column and in sediments (Southern CA Coastal Water Research Project); however, much more on surface than sub-surface.

Plastic Debris Impacts All Levels of the Marine Ecosystem









100% of Laysan Albatross Impacted (NOAA)





Economic Impact

- Asia-Pacific Economic Cooperation released a report valuing different marine debris abatement measures:
 - Loss of tourism from littered beaches in APEC region: \$622 million/year
 - Damage to Fishing Industry: \$364 million/year
 - Damage to Shipping Industry: \$279 million/year
 - Total cost of marine debris on APEC Region: \$1.265 billion/year
- * APEC Region has \$207 billion marine economy; California has \$46 billion marine economy.

California Coastal Cleanup Day

Largest volunteer event in the state

- 2011 Results:
 - 71,794 volunteers.
 - 1,345,776 pounds of debris – largest recyclables haul in history!
 - Over 2,000 linear miles of shoreline cleaned.
- Since 1985:
 - Over 1.1 million volunteers.
 - Over 18,000,000 pounds of debris removed.

Local Initiatives

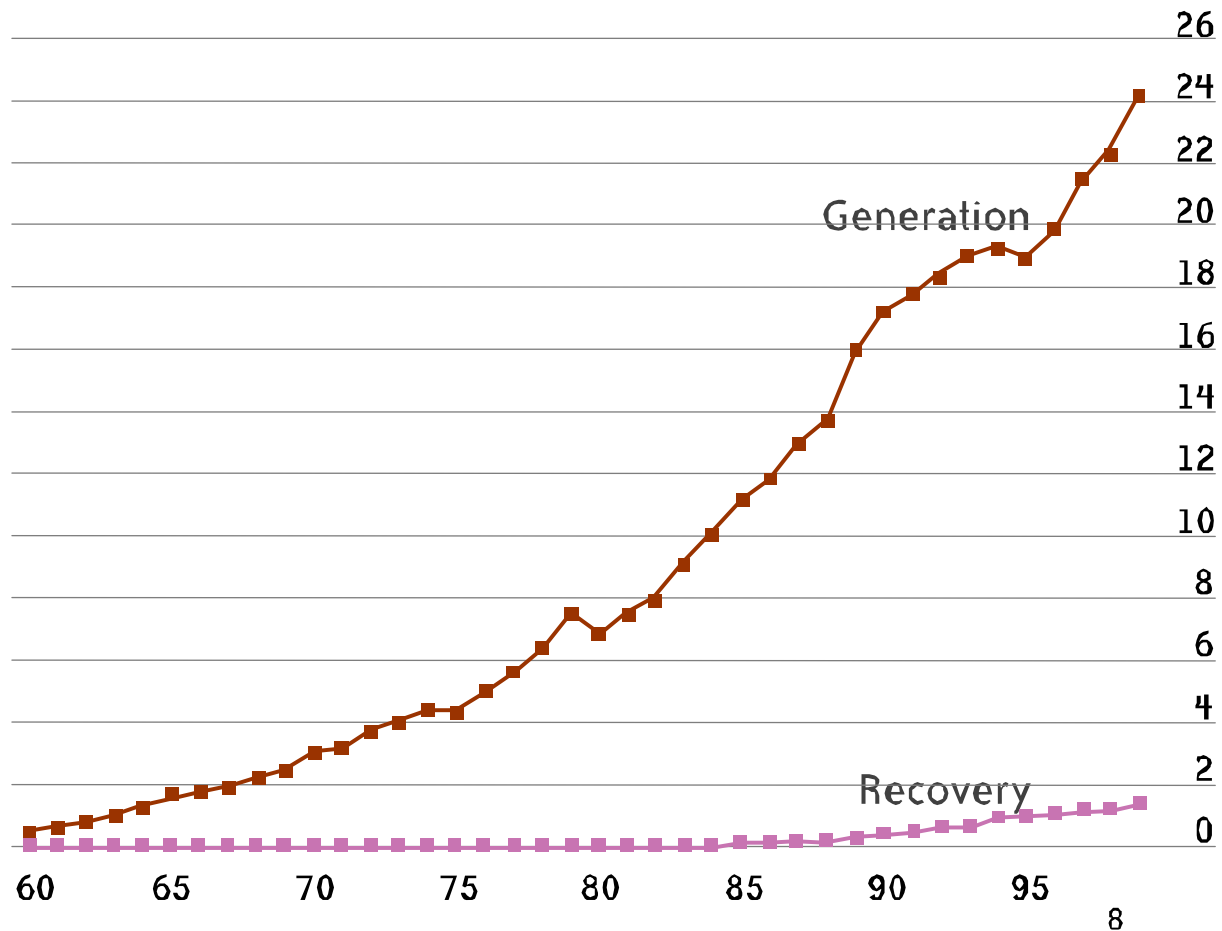
- Plastic bag bans or fees since 2006/2007
- Smoke free beach initiatives being implemented in cities up and down coast since 2005
- Polystyrene bans since 2006
- Stormwater regulations (TMDLs) in place and forcing the use of more effective trash collection devices in cities
- “Don’t Trash California” and “Erase the Waste” education campaigns

Trash Generation Increasing

- Average amount of trash disposed of in U.S. households per day:
 - 2.7 lbs. in 1960
 - 4.1 lbs. in 2001
 - 94% of materials used in manufacture of average U.S. product are thrown away before the product reaches the shelves
 - For every 100 pounds of product manufactured in the U.S., 3,200 pounds of waste generated
- Diversion Is Not a Cure
 - 48% diversion (recycling) rate in CA, compared to 30% nationwide
 - The amount of solid waste generated increases each year, so there's an increasing amount of material that can become litter
 - U.S. system of integrated waste management (the 3 R's) doesn't reduce the amount of waste generated

Recovery of Plastics in CA

Plastic waste generation versus recovery (recycling)- CIWMB
Million Tons per Year



Source: .

California's Plan

In 2008, the California Ocean Protection Council approved a strategy and implementation plan for addressing marine debris:

3 main elements of the strategy:

1. Implement system of Extended Producer Responsibility for packaging waste in California.
2. Ban specific items that are highly likely to become marine debris where alternatives are readily available.
3. Place a fee on other items that are likely to become marine debris but where a ban isn't feasible.

WEST COAST GOVERNORS' AGREEMENT on OCEAN HEALTH

CALIFORNIA OREGON WASHINGTON

- Marine Debris Team recently completed draft strategy and began formation of tri-state Marine Debris Alliance.

- Strategy borrows heavily from California's plan, while allowing for local conditions.







THANK YOU
THANK YOU
THANK YOU



HAVE A NICE DAY

FOR THE...
THE...
PREVENT BREATHING



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