

CLEVELAND

2016



marcus@5gyres.org



"The best
come in C





"You SEE
what you
buy-no
guesswork."


"Foods co
fresh-st
fresh lo
less was



You see so many good things in Du Pont Cellophane

You see  the good things you buy...no guesswork.

They come fresh  stay fresh longer—less waste.

And Cellophane keeps them extra-clean  and sanitary.

DU PONT
Cellophane



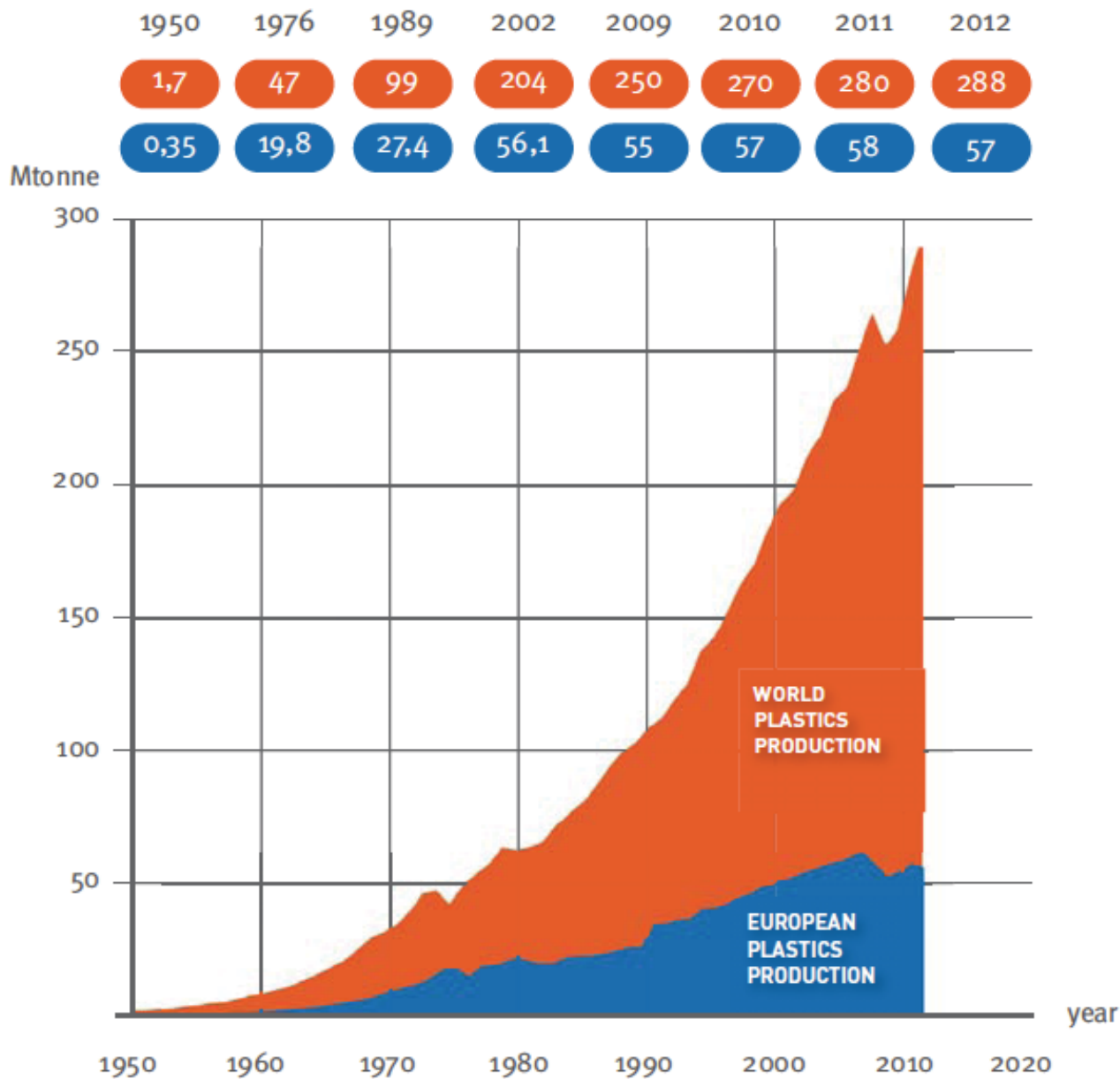
BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY
Look at "Cavalcade of America" on Television

e
lophane

DU PONT
Cellophane



BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY
Look at "Cavalcade of America" on Television



The plastics industry has benefited from 50 years of growth with a year on year expansion of 8.7% from 1950 to 2012, with a global production of 288 million tons produced in 2012.

Figure 2: World plastics production 1950-2012

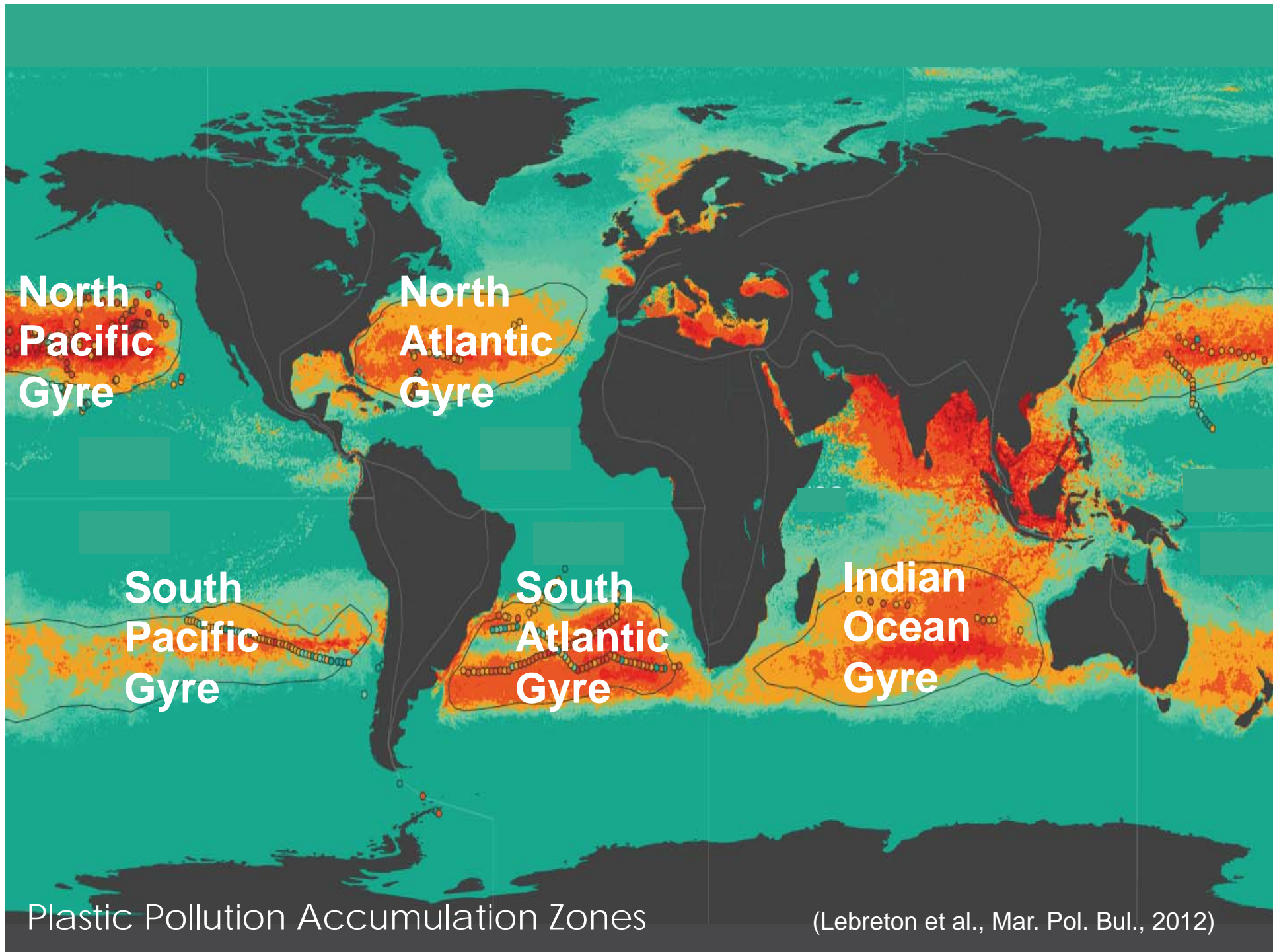
Includes thermoplastics, polyurethanes, thermosets, elastomers, adhesives, coatings and sealants and PP-fibers. Not included PET-, PA- and polyacryl-fibers

Source: PlasticsEurope (PEMRG) / Consultic

“THROW AWAY LIVING” 2005



GLOBAL DISTRIBUTION





NORTH ATLANTIC GYRE



NORTH PACIFIC GYRE



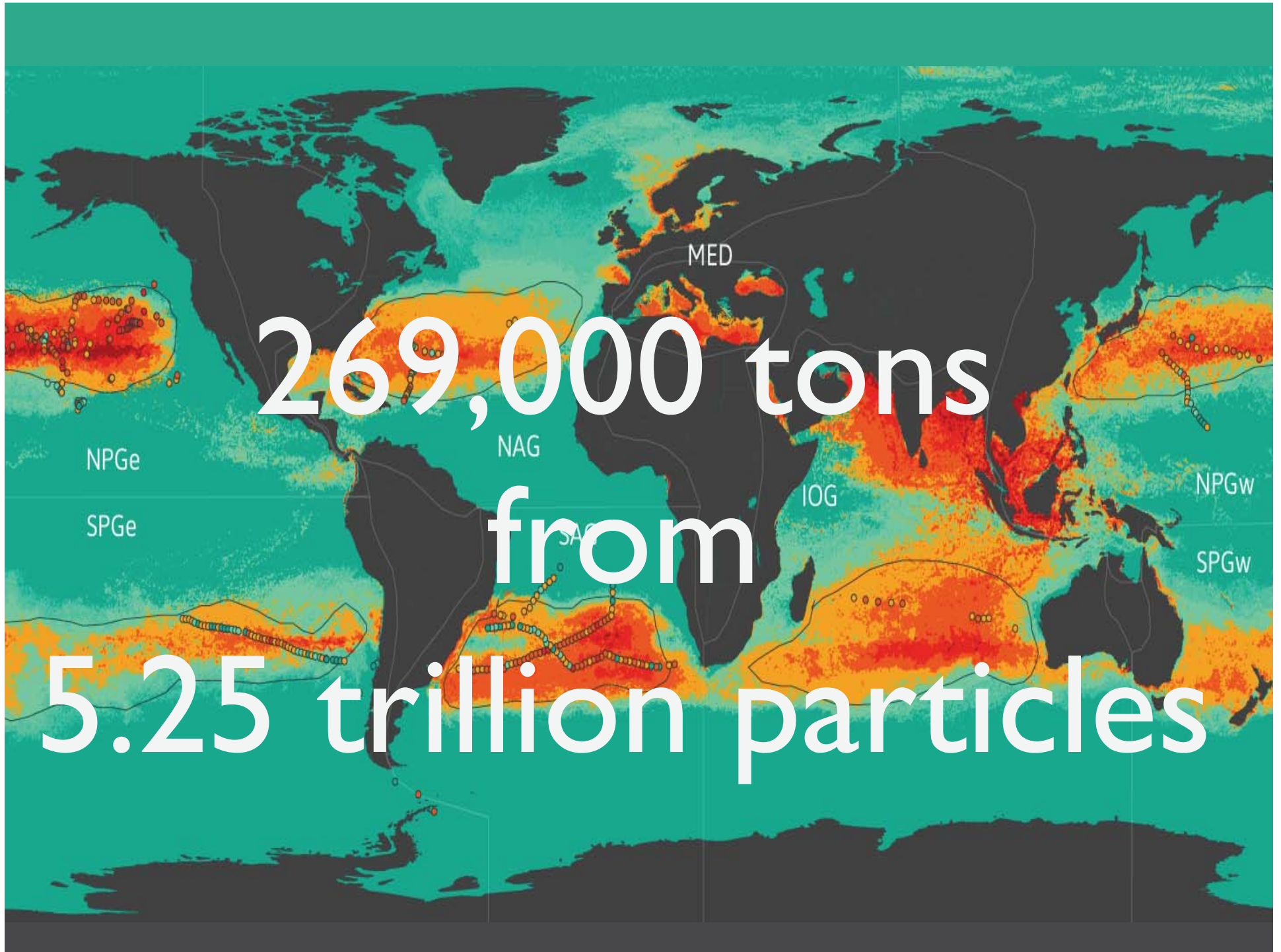
INDIAN OCEAN GYRE



SOUTH ATLANTIC GYRE



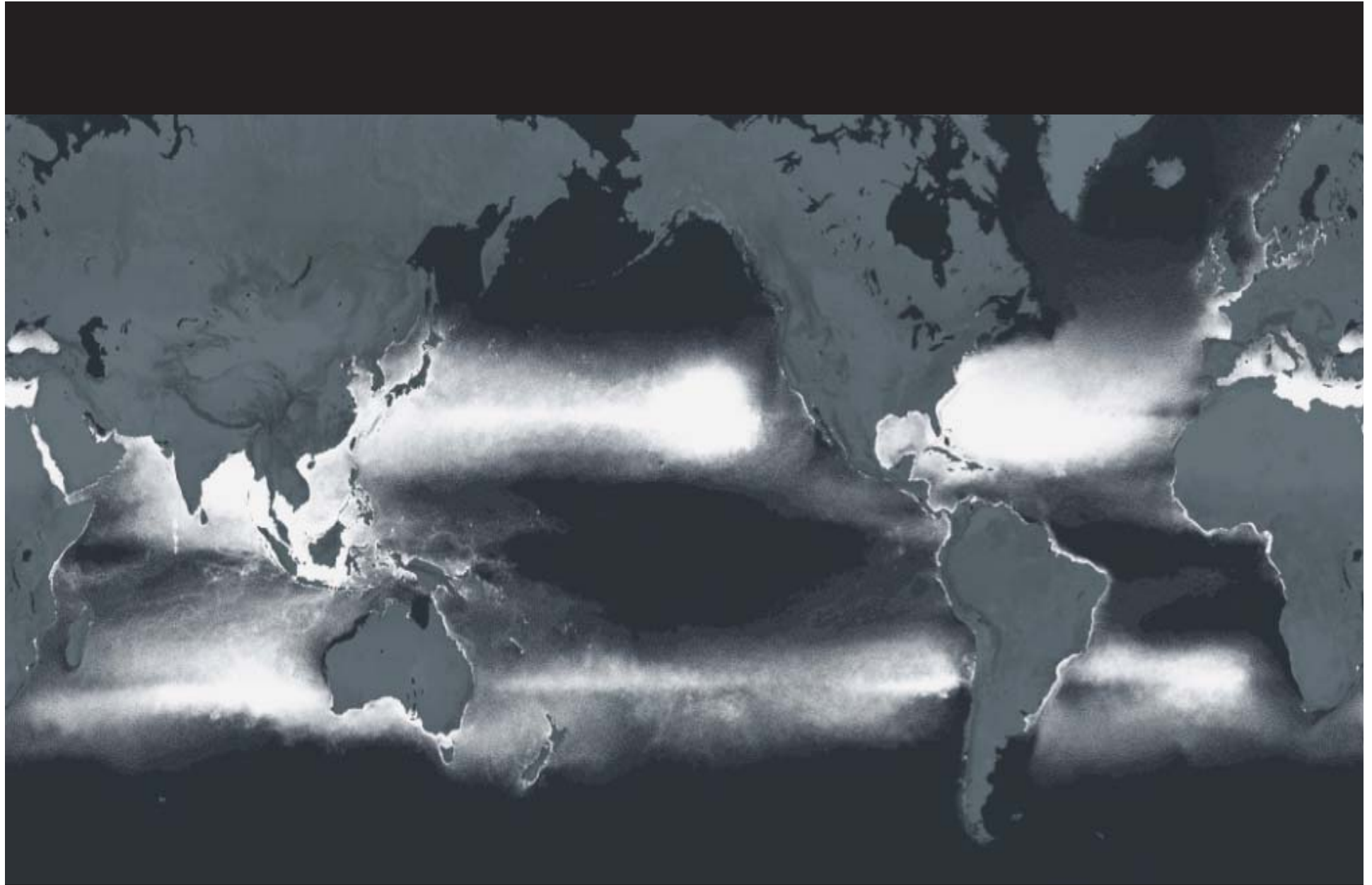
SOUTH PACIFIC GYRE



269,000 tons

from

5.25 trillion particles



PLASTIC SMOG



SEA CHANGE 2015



**NORTH
AMERICA**

New York, NY

St. George, Bermuda

New Orleans

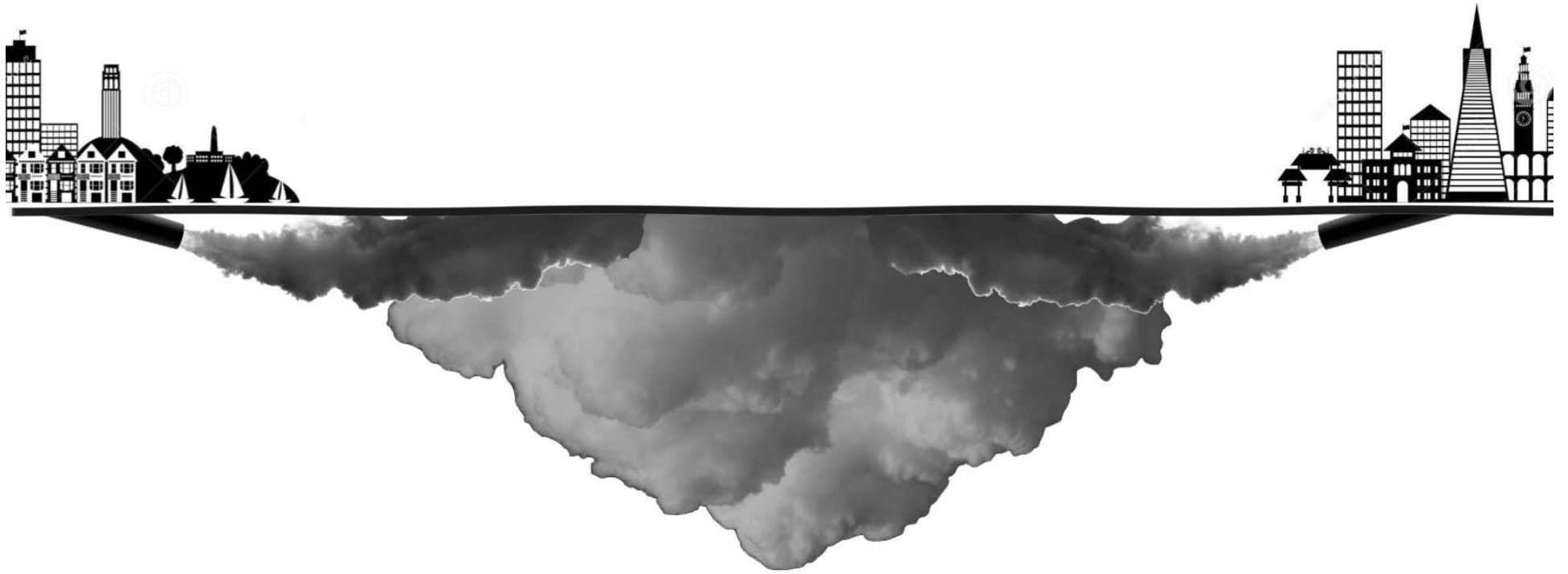
Miami, Fla.

Cape Eleuthera, Bahamas

Gulf of Mexico

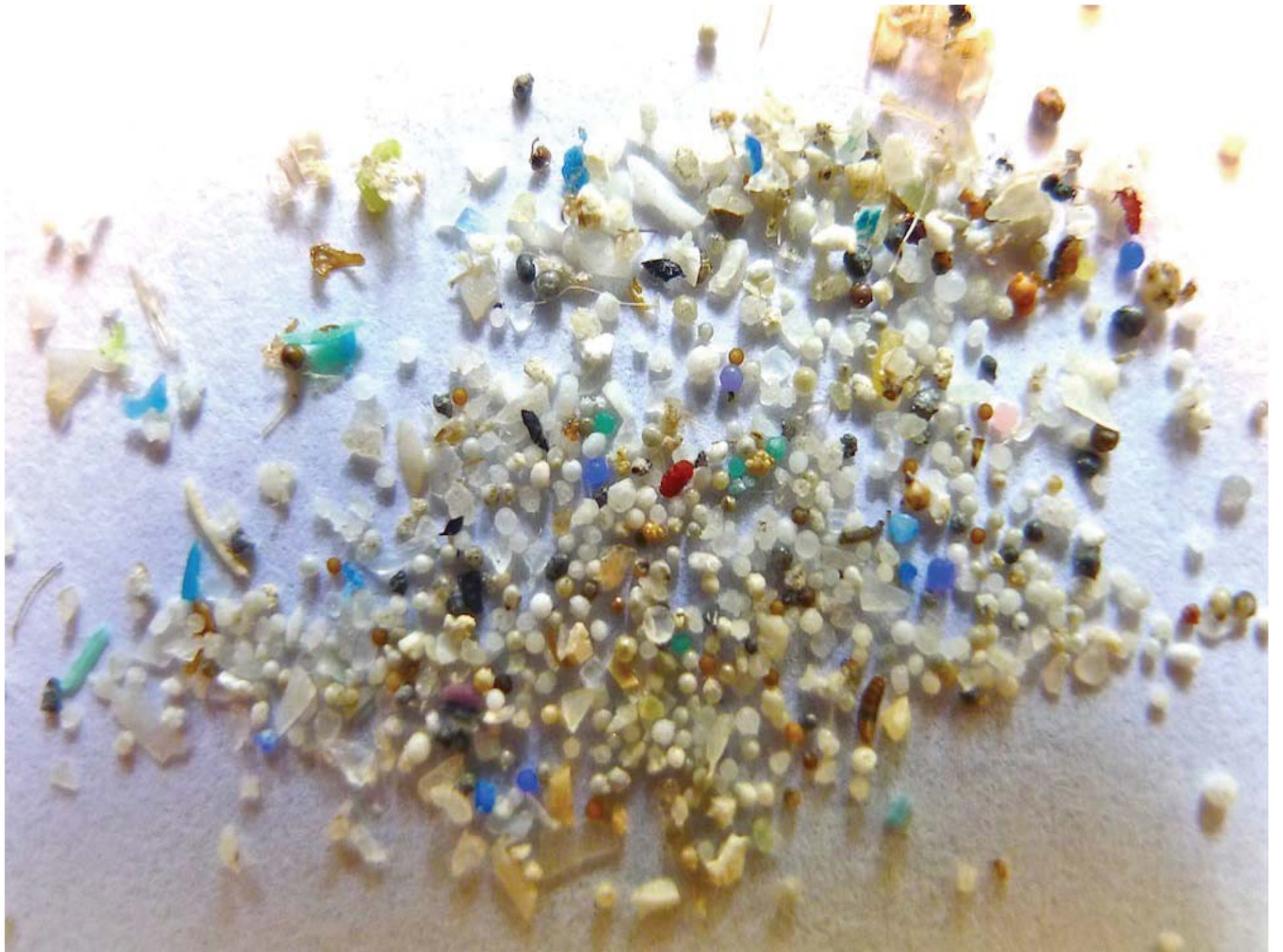








2012 Great Lakes Expedition





POOR PRODUCT DESIGN



TIRE DUST



NURDLES



TURF FIBER



TOOLED SHAVINGS



UV SHREDDING



DRYER EXHAUST



CARPET WEAR



ROAD ABRASION OF TRASH



DESIGNED WASTE

WHAT IS THE
ECOLOGICAL
IMPACT?



DERELICT FISHING GEAR



ENTANGLEMENT

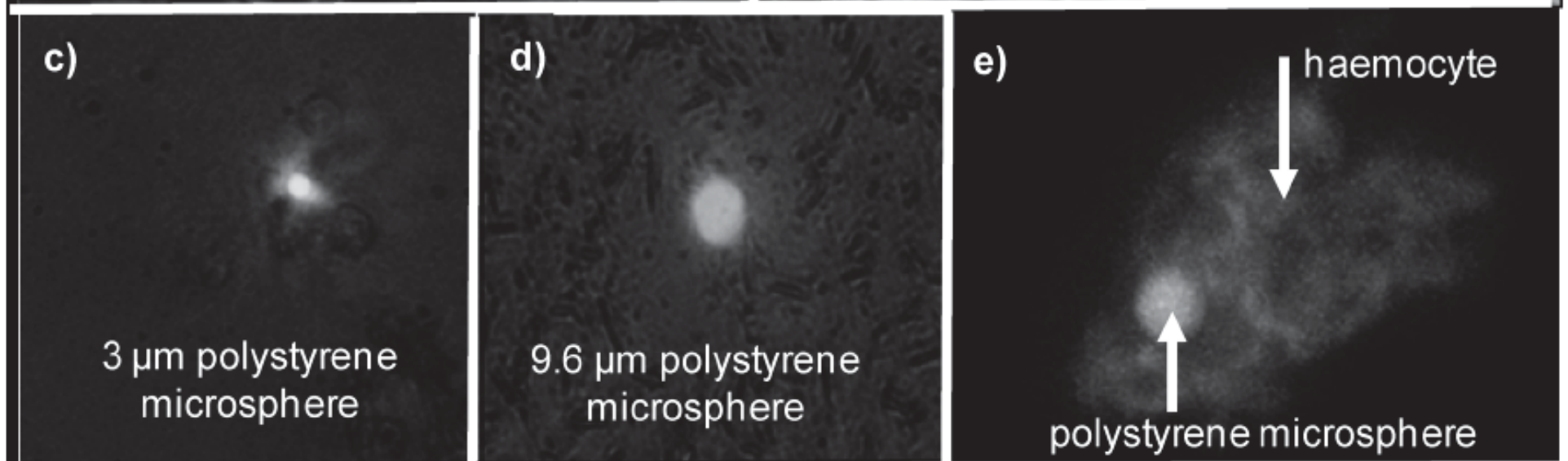
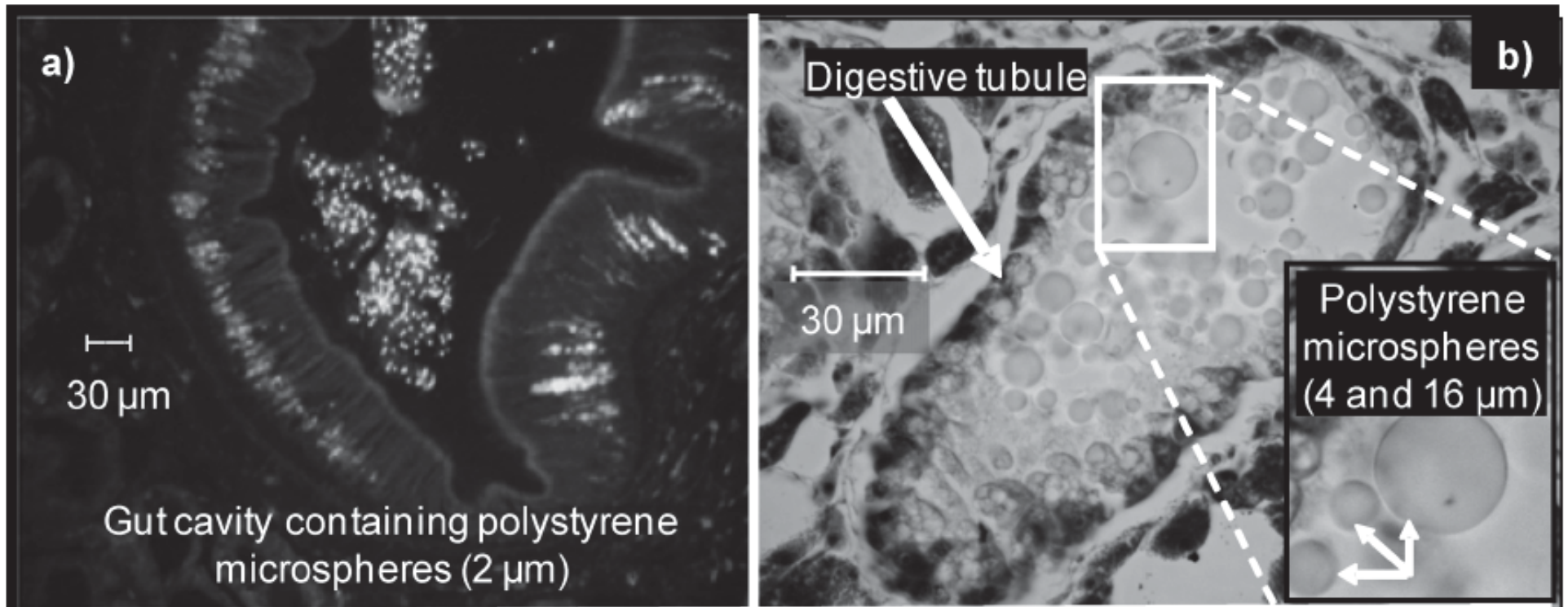


INGESTION

Photo: Chris Jordan



MICROPLASTIC INGESTION



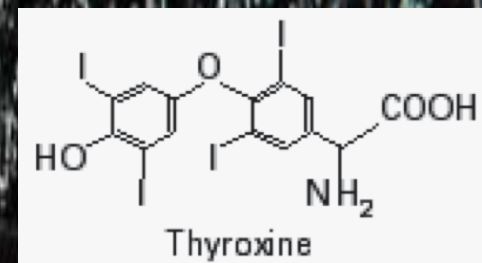
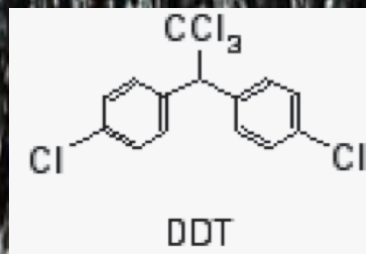
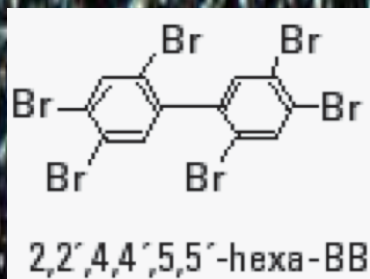
TRANSLOCATION FROM STOMACH TO CIRCULATORY SYSTEM

(Browne, 2008)





Time at Sea 







WHERE IS IT ALL
GOING?


PHOTODEGRADATION
OXIDATION
MECHANICAL DEGRADATION



BIODEGRADATION

(Zettler et al., 2013)

2 μm



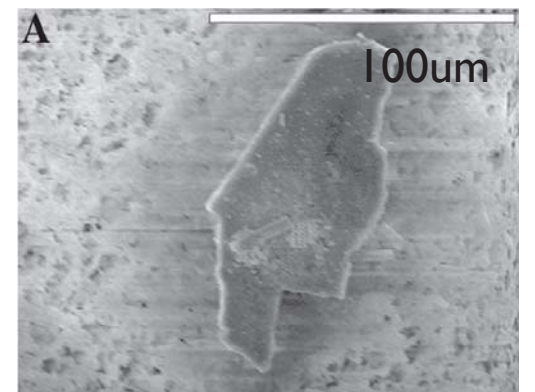
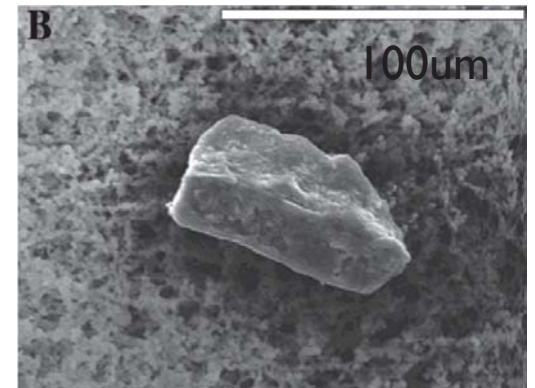
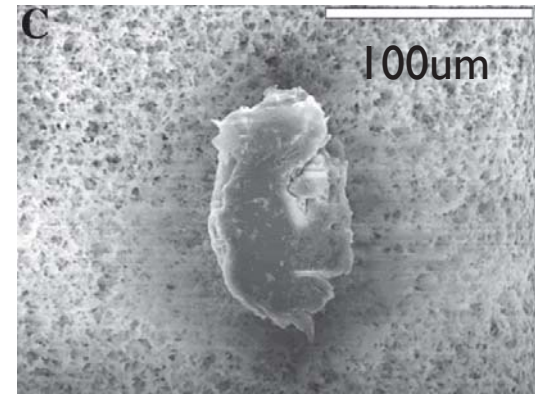
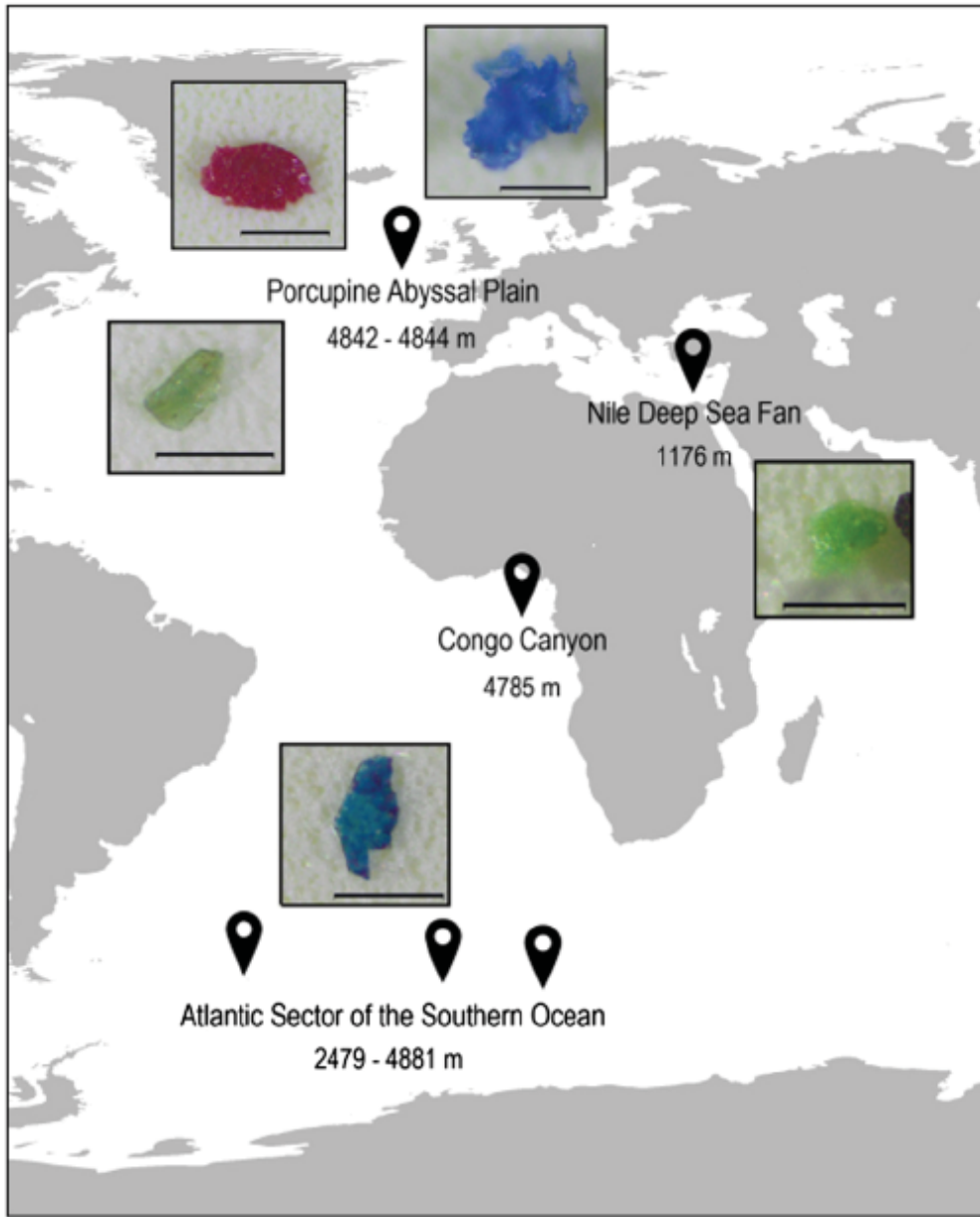


**FRAGMENTATION
BY GRAZING**

SHORELINE DEPOSITION



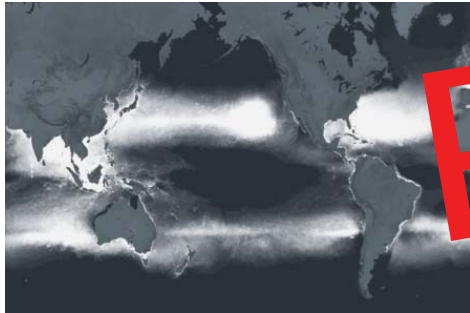




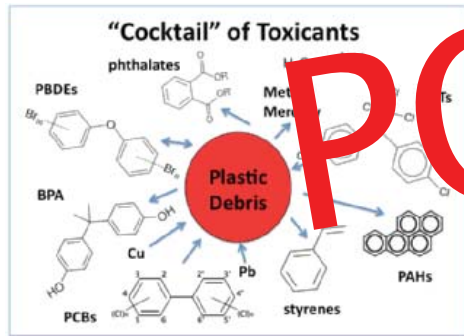
DEEP SEA DEPOSITION

(Cauwenberghe, 2013)

THREE CONCLUSIONS



- GLOBAL DISTRIBUTION



- TOXICITY

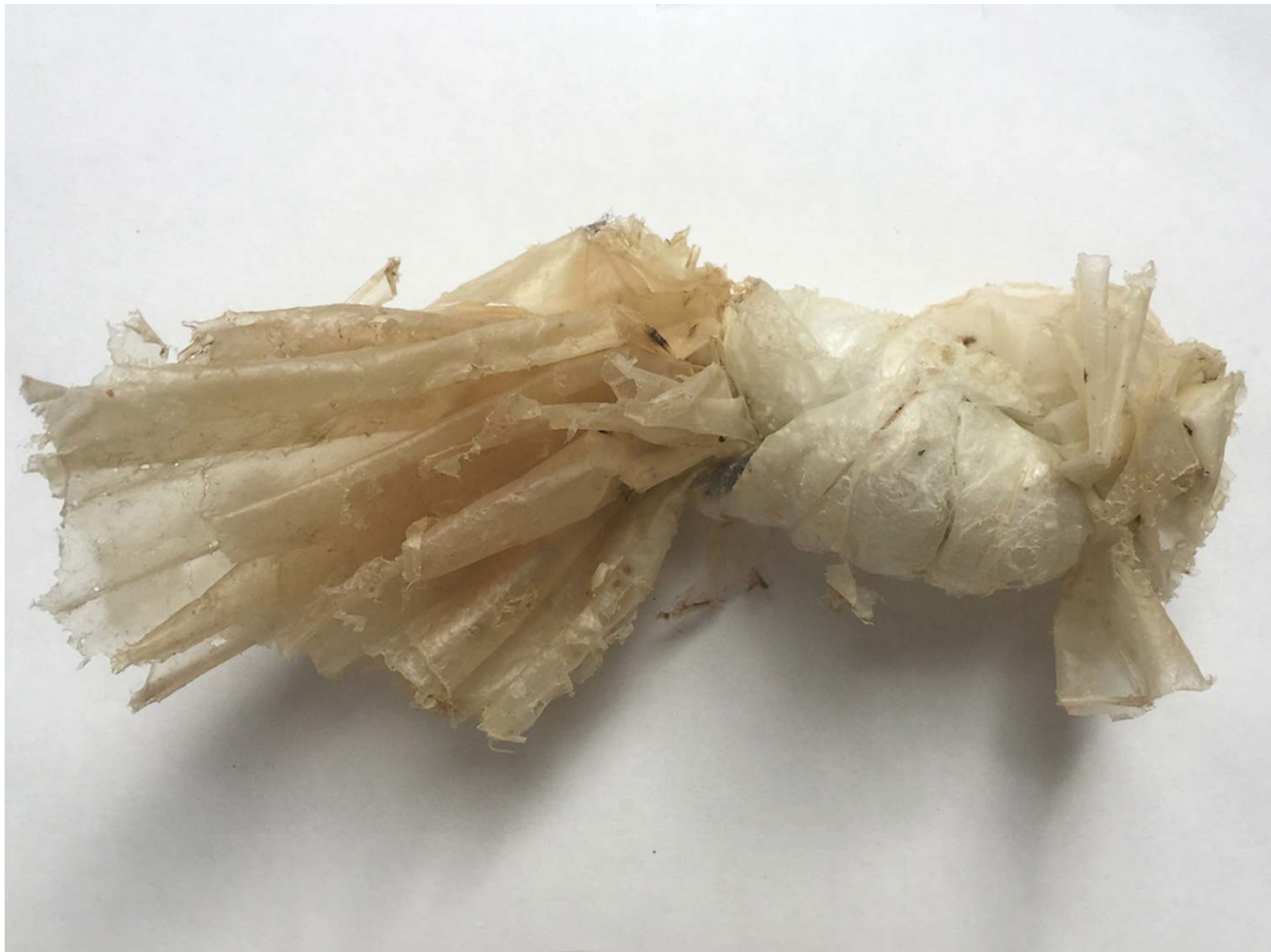


- ECOSYSTEM-WIDE IMPACTS

PLASTIC POLLUTION CAUSES "HARM"

**FOCUS ON
PLASTIC BAGS**







Undeniable Trend in Bag Bans



REUSABLE BAGS: FALLACY OF CLEANLINESS ARGUMENT

Wash your
bags...



...like you
wash your
socks.



DOUBLE SPEAK RECYCLING OR LANDFILL?



LCA of Convenience

- LCA 1 – plastic bag vs. paper bag
- LCA 2 – double bag vs. paper bag
- LCA 3 – plastic bag vs. recycled paper bag
- LCA 4 – compostable bag vs. plastic bag
- LCA 5 – recycled plastic bag vs. paper
- LCA 6 – no bag vs. any bag

ALL LCA's

EXTERNALIZE ENVIRONMENTAL COSTS

1000x reuse and going ...



WORD MANIPULATION & DOUBLE TAXATION

- CITY TAX
 - (cleanup of plastic bags = MWM taxes)
- SALES TAX
 - (Grocers increase the cost of goods in order to absorb the cost of plastic bags. Customers pay sales tax on those increases.)

MRF MAYHEM

“What is missed on the conveyor belt tumbles over a giant rotor with stubby teeth that separates cardboard from the rest of it. This is where plastic bags get stuck and clog the system. The damn things blow around. They’re usually full of other junk, like dog poop. They’re more trouble than they’re worth.”

Anonymous MRF owner

TOO WASTEFUL TO VALUE

There's harsh economics behind bag recycling: It costs \$4,000 to process and recycle 1 ton of plastic bags, which can then be sold on the commodities market for \$32.

Jared Blumenfeld

(Director of San Francisco's Department of the Environment)

It's cheaper for me to send my plastic bags to China than spend \$62/ton at the landfill.

Joe Garbarino

Marin County Recycling

PROBLEM SUMMARY

- Design facilitates loss to environment
- Plastic is dangerous in the environment
- Recovery rates continue to fail
- MRF mayhem
- Too taxing to the public
- Stifles innovation and US jobs

SOLUTIONS

- Embrace science
- Lead innovation
- Support true cost LCA's
- Support EPR beyond recycling
- Reject the path of frivolous lawsuits



**URGE RETAILERS TO
PROVIDE CUSTOMERS
CARBOARD BOXES**

TRANSFORM CULTURE

Throw Away
Living



Heirloom
Culture



CLEVELAND

2016



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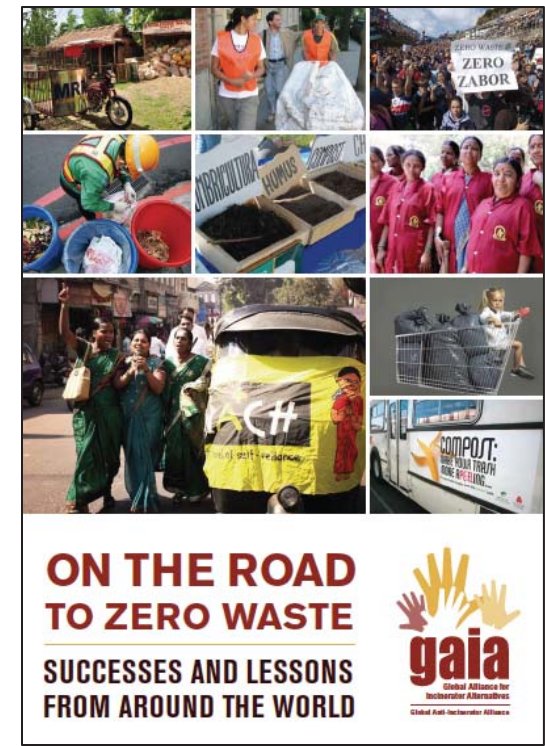




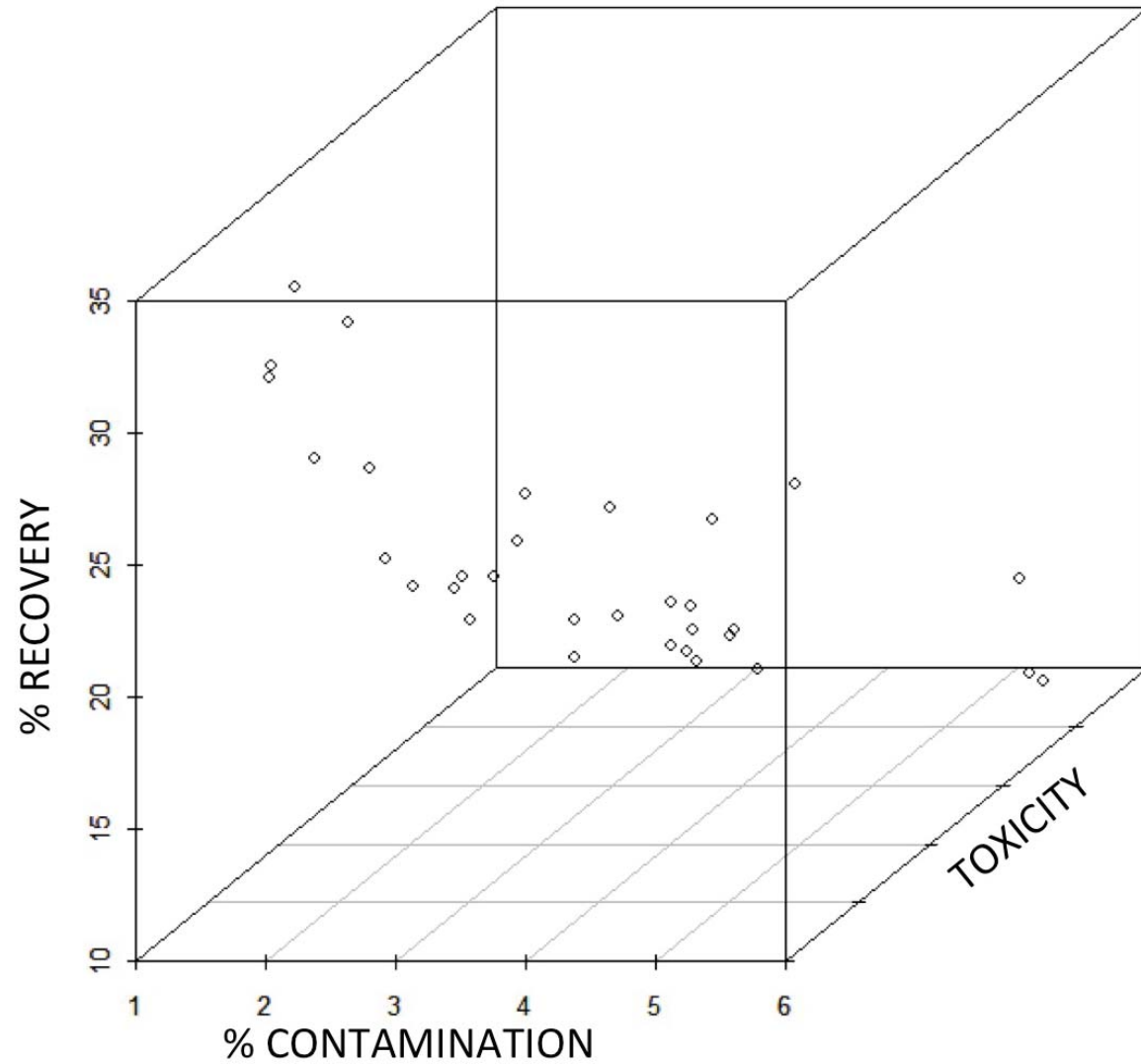


THE GREAT DIVIDE

LINEAR ECONOMY vs CIRCULAR ECONOMY



SIN LIST: PRODUCT/PACKAGING/BRAND IMPACTS



YOUTH
DRIVING
SOLUTIONS



YOUTH TAKING CHARGE – TRASH AUDIT



YOUTH SPEAKING OUT



YOUTH LEADERS



**MORE OCEAN,
LESS PLASTIC**

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**Marcus Eriksen
The 5 Gyres Institute**