

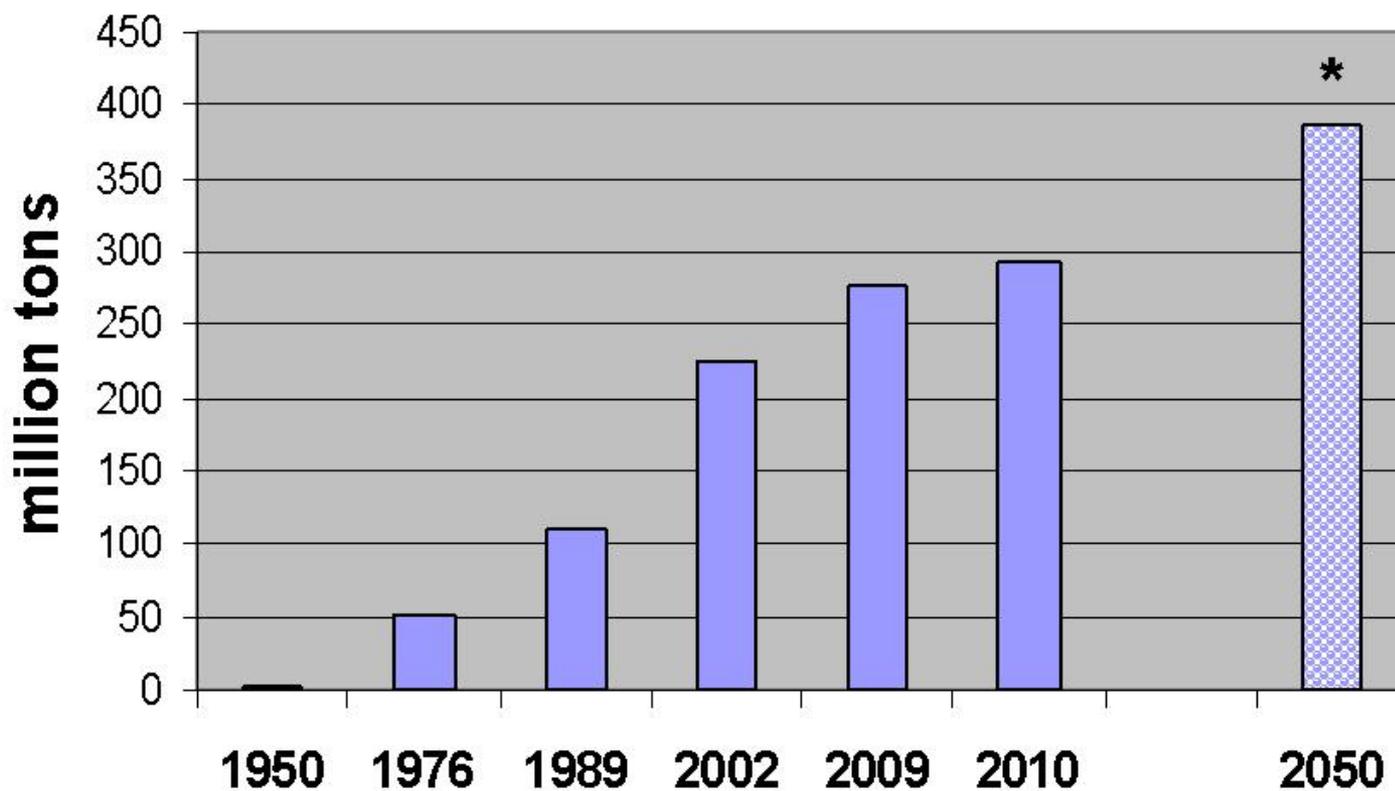
Taking Aim: Making Shotgun Wads that Won't Last Forever

Dr. Kirk Havens
Director
Coastal Watersheds Program
Virginia Institute of Marine Science
College of William & Mary

Dr. Donna Marie Bilkovic, David Stanhope, Kory Angstadt



Annual World Plastics Production



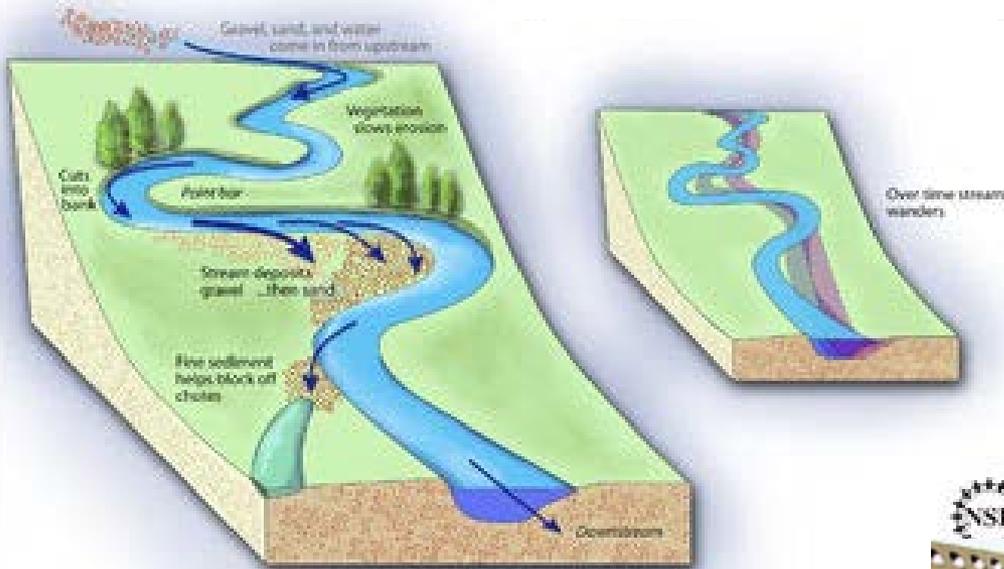
Source: PlasticsEurope Market Research Group

Plastic and microplastic



Approximately 288 million tons of plastic is produced annually.

Plastic has been found in the deep sea and buried in Arctic ice.



About 8 million tons ends up dumped in the ocean every year.

(about 5 plastic bags per foot per global shoreline)



HOW LONG UNTIL IT'S GONE?

Estimated decomposition rates of common marine debris items



Estimated individual item timelines depend on product composition and environmental conditions.



Plastic shotgun wads



An estimated 10-15 billion plastic shotgun wads are produced annually.

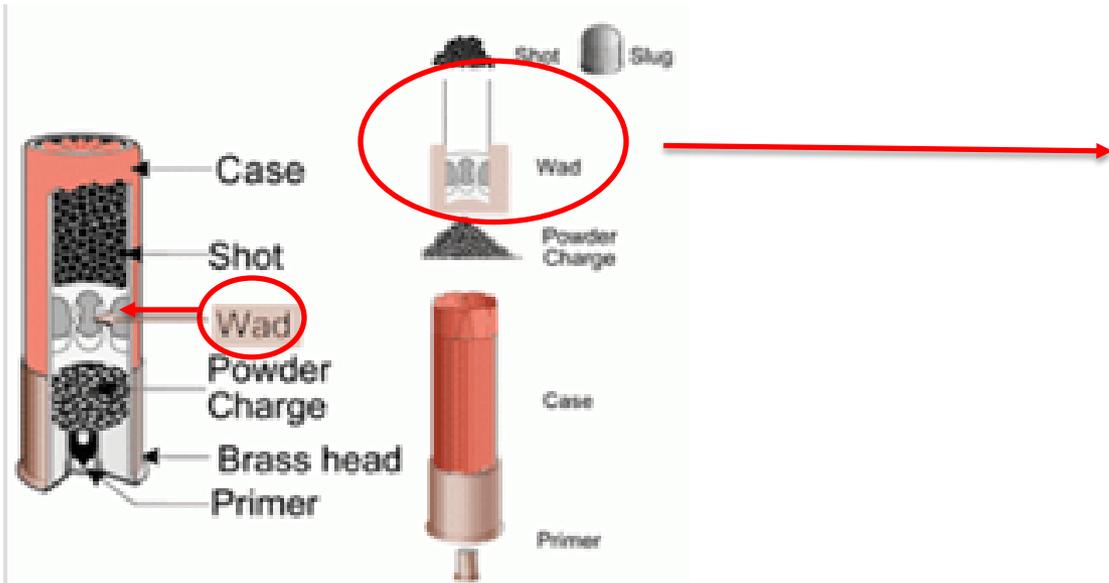
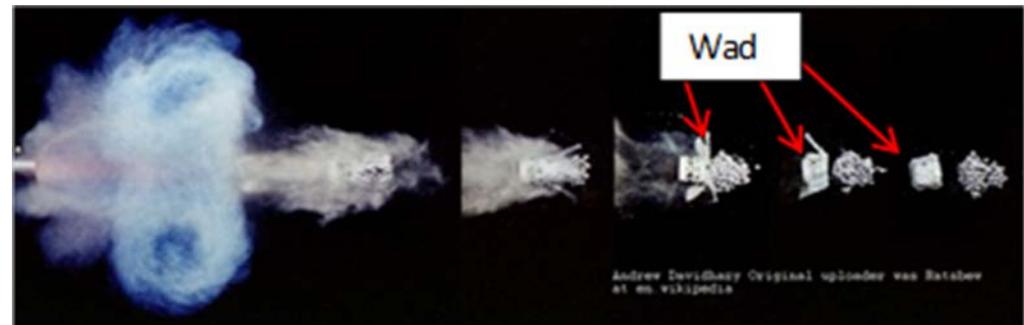


Figure 1. Shotgun shell schematic.



High speed photography of standard plastic wad.





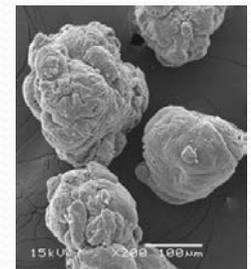




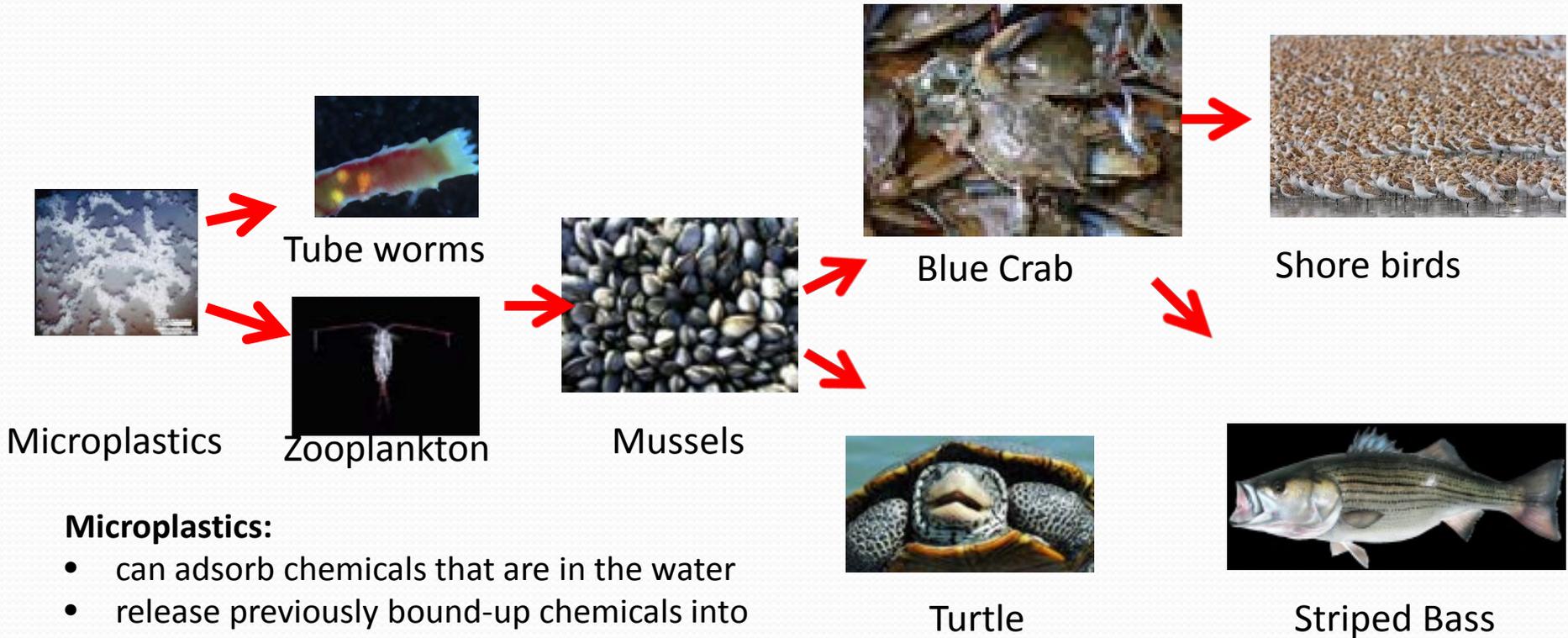
Fragmentation, photo-degradation, degradation

Microplastics

biodegradation (CO₂, water, biomass)



This is a problem because....



Microplastics:

- can adsorb chemicals that are in the water
- release previously bound-up chemicals into the water as they breakdown
- readily take up PCBs and DDTs
- can introduces toxins into the food chain
- create obstructions that keep the organisms from taking in enough food, leading to malnutrition or starvation



VIMS has developed a biodegradable shotgun wad from the polyhydroxyalkanoate (PHA) polymer



Dungeness Crab



American Lobster



Stone Crab



Spiny Lobster

www.mobjackbp.org

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MOBJACK
BIRNACKE PRODUCTS

Welcome

Mobjack Birnacke Products, LLC specializes in developing innovative ideas into products for the marketplace. Mobjack's primary focus is the manufacturing and distribution of specialized products for individual or commercial use.

Our targeted market segment is retailers who carry specific environmentally friendly products for, but not limited to, watermen, hunters, commercial and individual fishermen, outdoorsmen, and those who recreate outdoors. Mobjack strives to provide products that enhance the outdoor experience while

Our Mission

Mobjack uses state of the art, environmentally responsible materials to produce high quality products that support a sustainable environment for professionals and outdoor enthusiasts.

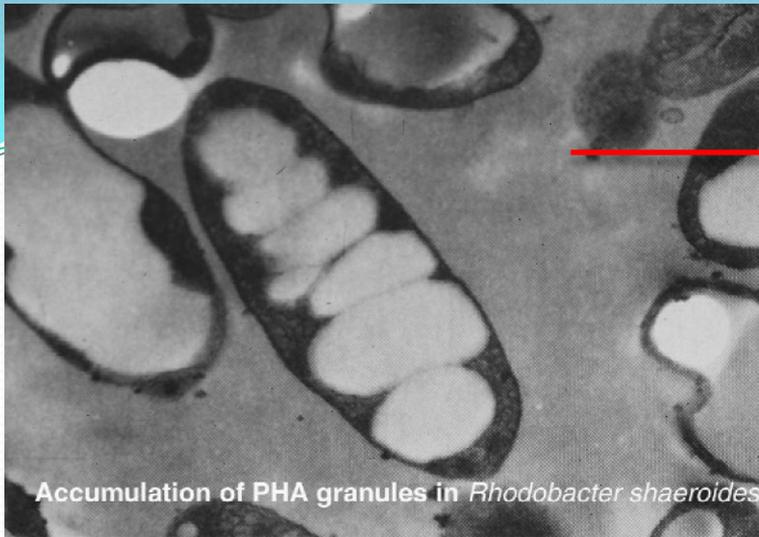
Our Products

Mobjack's products are a fail safe against lost crab, lobster and fish traps (known as "ghost pots" or "ghost fishers"). Our products use our patented technology to prevent traps from continuing to catch and kill marine life.

Mobjack products degrade completely into naturally occurring, environmentally friendly microbes. Our products address the ghost pots issue that depletes marine resources.

MORE MORE

What is PHA?



- PHA meets the American Society of Testing and Materials certification as biodegradable in aquatic environments.
- European Standards and Vincotte International certification for biodegradation.
- The US Food and Drug Administration standards for use in food contact, housewares, cosmetics, and medical packaging.
- Medical applications such as sutures and drug delivery (pills).

Biodegradability:

- 1- Intracellular degradation (mobilisation) of Polyhydroxyalkanoates (PHA), ((dehydrogenase reaction))
- 2- Extracellular Degradation of Polyhydroxyalkanoates (PHA), ((PHA depolymerases))

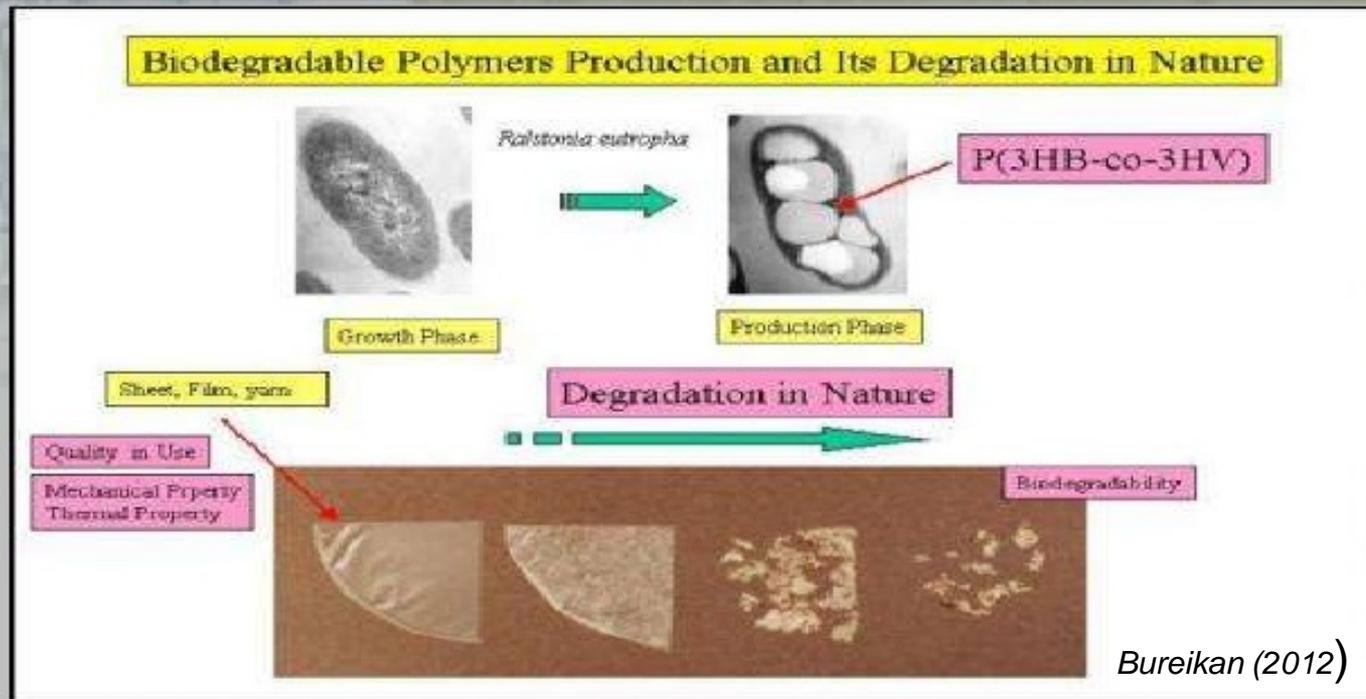
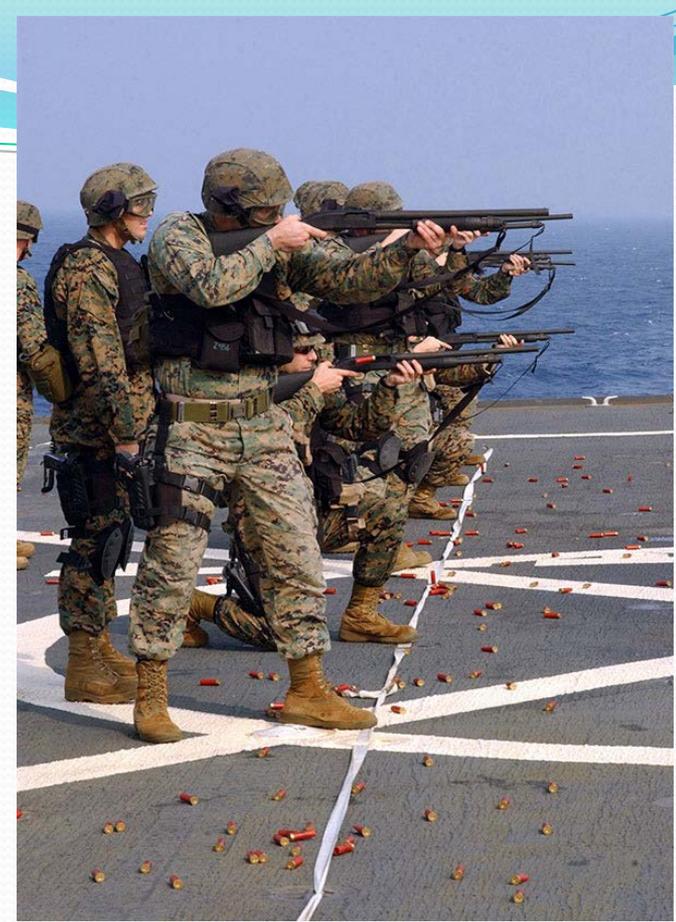




Figure 6. Sailors shooting 12 gauge shotguns off aircraft carrier USS Ronald Reagan. US NAVY PHOTO.



Shotguns are becoming the preferred weapon both commercially and by the military

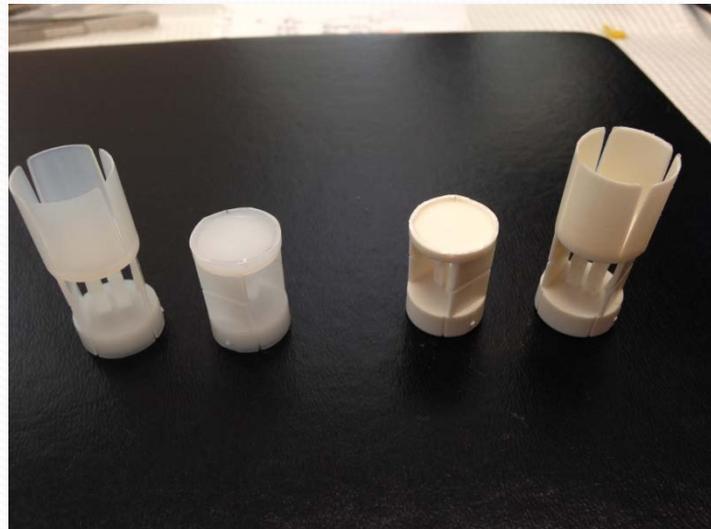
The military is also interested in a truly biodegradable wad



Degradable Internal Casing wad

Degradable Underwater Casing wad

DUCwad



Questions?

