Capt. Charles Moore on the seas of plastic

Let's talk trash.

You know, we had to be taught to renounce the powerful conservation ethic we developed during the Great Depression and World War II. After the war, we needed to direct our enormous production capacity toward creation of products for peacetime. Life Magazine helped in this effort by announcing the introduction of throwaways that would liberate the housewife from the drudgery of doing dishes.

Mental note to the liberators: throwaway plastics take a lot of space and don't biodegrade. Only we humans make waste that nature can't digest.

Plastics are also hard to recycle. A teacher told me how to express the under-five-percent of plastics recovered in our waste stream. It's diddly point squat. That's the percentage we recycle.

Now, melting point has a lot to do with this. Plastic is not purified by the re-melting process like glass and metal. It begins to melt below the boiling point of water and does not drive off oily contaminants for which it is a sponge. Half of each year's 100 billion pounds of thermal plastic pellets will be made into fast-track trash. A large, unruly fraction of our trash will flow down rivers to the sea.

Here is the accumulation at Biona Creek next to the airport. And here is the flotsam near California State University Long Beach and the de-sal plant we visited yesterday.

In spite of deposit fees, much of this trash leading out to the sea will be plastic beverage bottles. We use two million of them in the United States every five minutes, here imaged by TED presenter Chris Jordan who artfully documents mass consumption and zooms in for more detail.

Here is a remote island repository for bottles off the coast of Baja California. Isla San Roque is an uninhabited bird rookery off Baja's sparsely-populated central coast. Notice that the bottles here have caps on them. Bottles made of polyethylene terephthalate, PET, will sink in seawater and not make it this far from civilization. Also, the caps are produced in separate factories from a different plastic, polypropylene. They will float in seawater, but unfortunately do not get recycled under the bottle bills.

Let's trace the journey of the millions of caps that make it to sea solo. After a year the ones from Japan are heading straight across the Pacific, while ours get caught in the California current and first head down to the latitude of Cabo San Lucas. After ten years, a lot of the Japanese caps are in what we call the Eastern Garbage Patch, while ours litter the Philippines. After 20 years, we see emerging the debris accumulation zone of the North Pacific Gyre.

It so happens that millions of albatross nesting on Kure and Midway atolls in the Northwest Hawaiian Islands National Monument forage here and scavenge whatever they can find for regurgitation to their chicks. A four-month old Laysan Albatross chick died with this in its stomach. Hundreds of thousands of the goose-sized chicks are dying with stomachs full of bottle caps and other rubbish like cigarette lighters ... But, mostly bottle caps. Sadly, their parents mistake bottle caps for food tossing about in the ocean surface.

The retainer rings for the caps also have consequences for aquatic animals. This is Mae West, still alive at a zookeeper's home in New Orleans.

I wanted to see what my home town of Long Beach was contributing to the problem, so on Coastal Clean-Up Day in 2005 I went to the Long Beach Peninsula at the east end of our long beach. We

cleaned up the swaths of beach shown. I offered five cents each for bottle caps. I got plenty of takers. Here are the 1,100 bottle caps they collected. I thought I would spend 20 bucks. That day I ended up spending nearly 60.

I separated them by color and put them on display the next Earth Day at Cabrillo Marine Aquarium in San Pedro. Governor Schwarzenegger and his wife Maria stopped by to discuss the display. In spite of my "girly man" hat, crocheted from plastic shopping bags, they shook my hand. I showed him and Maria a zooplankton trawl from the gyre north of Hawaii with more plastic than plankton.

Here's what our trawl samples from the plastic soup our ocean has become look like. Trawling a zooplankton net on the surface for a mile produces samples like this. And this. Now, when the debris washes up on the beaches of Hawaii it looks like this. And this particular beach is Kailua Beach, the beach where our president and his family vacationed before moving to Washington.

Now, how do we analyze samples like this one that contain more plastic than plankton? We sort the plastic fragments into different size classes from five millimeters to one-third of a millimeter. Small bits of plastic concentrate persistent organic pollutants up to a million times their levels in the surrounding seawater.

We wanted to see if the most common fish in the deep ocean, at the base of the food chain, was ingesting these poison pills. We did hundreds of necropsies, and over a third had polluted plastic fragments in their stomachs. The record-holder, only two-and-a-half inches long, had 84 pieces in its tiny stomach.

Now, you can buy certified organic produce. But no fish monger on Earth can sell you a certified organic wild-caught fish.

This is the legacy we are leaving to future generations. The throwaway society cannot be contained, it has gone global. We simply cannot store and maintain or recycle all our stuff. We have to throw it away. Now, the market can do a lot for us, but it can't fix the natural system in the ocean we've broken. All the king's horses and all the king's men ... will never gather up all the plastic and put the ocean back together again.

Video: The levels are increasing, the amount of packaging is increasing, the throwaway concept of living is proliferating, and it's showing up in the ocean.

Anchor: He offers no hope of cleaning it up. Straining the ocean for plastic would be beyond the budget of any country and it might kill untold amounts of sea life in the process. The solution, Moore says, is to stop the plastic at its source: stop it on land before it falls in the ocean. And in a plastic-wrapped and packaged world, he doesn't hold out much hope for that, either. This is Brian Rooney for Nightline, in Long Beach, California.

Charles Moore: Thank you.