



# LEAP LAB

The Science of a Sustainable Future

## JUNK & GYRE

An ocean adventure that led to research expeditions around the globe to study plastic pollution and the solutions that followed.



# ABOUT THE EXHIBIT



In 2008 the JUNK raft drifted for 88 days across the Pacific Ocean from Los Angeles to Hawaii. That adventure sparked the founding of the 5 Gyres Institute, leading to over 20 expeditions around the world to research plastic pollution. The mix of research, advocacy and wide collaborations led to successful policy and public awareness campaigns to solve the problem.

**MISSION:** To bring global attention to plastic pollution accumulating in the world's oceans.



# EXHIBIT AT A GLANCE

Exhibit pieces include:

- **JUNK raft**
- **Plastic face casts**
- **2x5 pull up panels**
  - What is a gyre?
  - Great Lakes Success
- **Plastic Pollution from the Sea**
  - The history of Throw Away Living
  - Fishing boat from the tsunami
  - 100lb Net Bolus
- **14"x 8" tapestries**
  - Plastic Smog: A map of the global distribution of marine plastic
  - Enlarged sample of microplastic from the N. Pacific Gyre
- **KIOSKS**
  - Ecological impacts
  - Junk & Gyre
- **Synthetic Equilibrium**

A companion book and film is available, as well as lectures from Marcus Eriksen, PhD.



JUNK

15,000 plastic bottles and an airplane floated to Hawaii from California to bring attention to the Great Pacific Garbage Patch



PULL-UP BANNERS

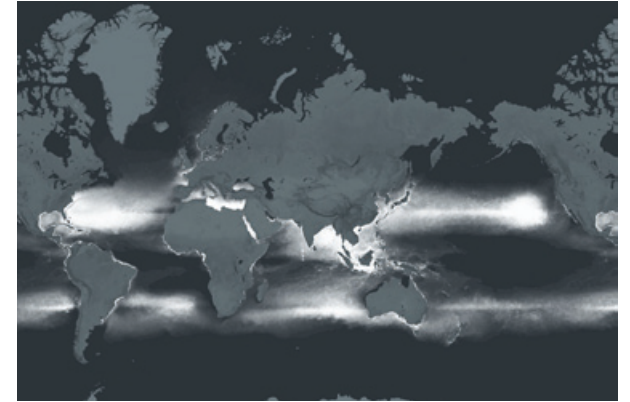




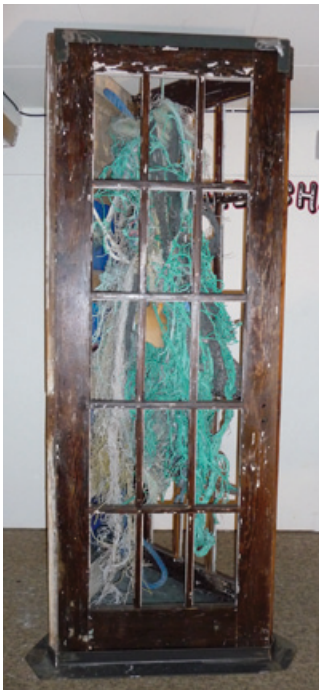
DERELICT NET BOLUS  
(100lb tangled mass of net  
found in N. Pacific near Japan).



GYRE SAMPLE  
(10'x8' tapestry)



PLASTIC SMOG  
(10'x8' tapestry)



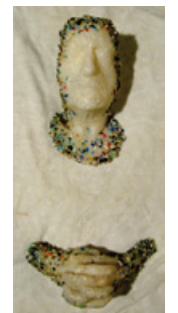
Kiosk 1  
ECOLOGICAL IMPACTS



Kiosk 2  
JUNK in GYRES



2011  
TSUNAMI FISHING BOAT





# JUNK RAFT

Floating an airplane across the Pacific Ocean required 15,000 empty 2-liter plastic bottles. It was a 310 Cessna fuselage to be exact, sitting atop 20 sailboat masts fashioned into a square deck. The bottles were stuffed into 30ft. long pontoons made from old fishing nets.

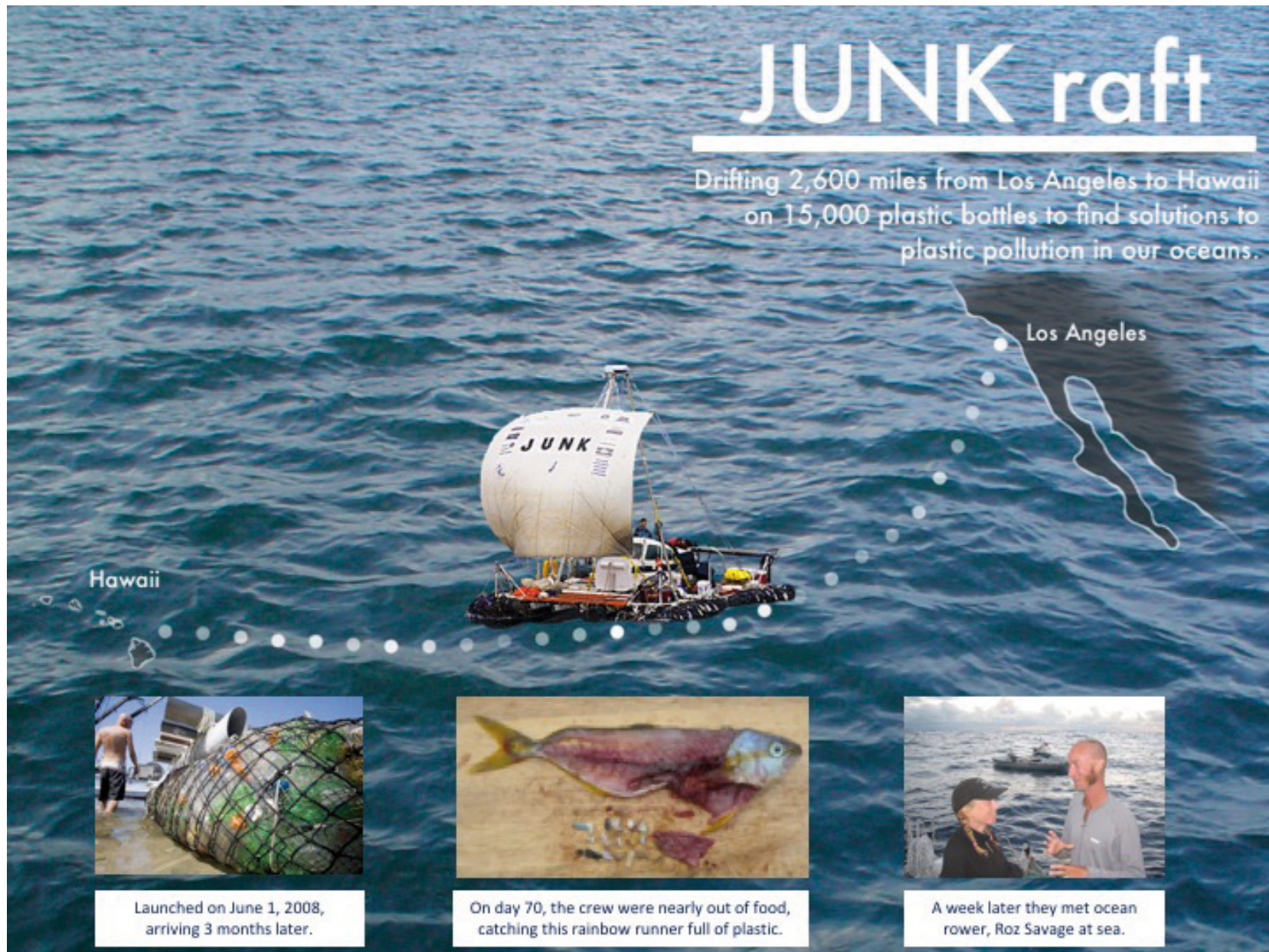
In 88 days at sea, the two-man crew outran 4 hurricanes, ran out of food and lived on plastic laden fish. Unbelievably, they met ocean-rower Roz Savage in the middle of the ocean, where they traded water for food. The sailors on this modern Kontiki documented their voyage and shared video/photos/journal entries with the public during the expedition, amassing one-half million viewers on the day JUNK arrived in Waikiki.





# JUNK raft

Drifting 2,600 miles from Los Angeles to Hawaii  
on 15,000 plastic bottles to find solutions to  
plastic pollution in our oceans.



Launched on June 1, 2008,  
arriving 3 months later.



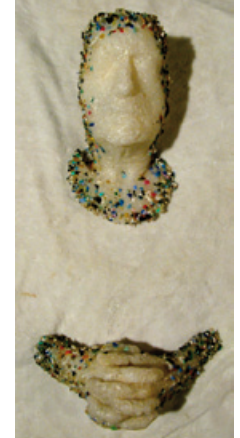
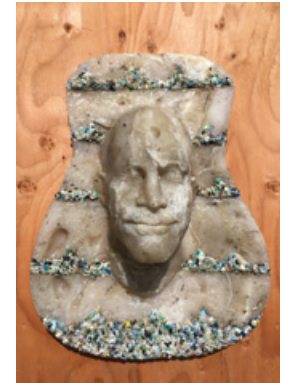
On day 70, the crew were nearly out of food,  
catching this rainbow runner full of plastic.



A week later they met ocean  
rower, Roz Savage at sea.

# PLASTIC FACE CASTS

There are many people working to solve the plastic pollution problem, from scientists to sailors, CEOs to songwriters. These masks were made from live casts of people, then plastic pollution was melted into the mold.





# PLASTIC FACE CASTS



Dr. Sylvia Earle

## Witness to plastic on the sea floor

Sylvia Earle "Her Deepness" has seen the ocean floor become littered with plastic waste over her 50 years of exploration. PET plastic bottles, PVC, vinyl, polycarbonate, polystyrene, and virtually all resins and epoxies sink. They are extremely difficult to recover at depths below safe scuba diving.



Anna Cummins

## Her body burden of synthetic chemicals

In 2010 Anna Cummins, co-founder of 5 Gyres Institute, had her blood serum analyzed for persistent organic pollutants.

The test found DDT, PCBs, and flame retardants. On Aug. 3rd 2012 she had a baby, who will receive these pollutants through birth and breastfeeding.

Plastic pollution from around the world had been melted into the body cast of Ms. Cummins at the 5-month stage of her pregnancy.



# PLASTIC FACE CASTS



Dr. Hidshige Takada

Plastic floating in the ocean absorbs and transports toxins around the world.

Dr. Hidshige Takada, from the Tokyo University of Agriculture and Technology founded International Pellet Watch, inviting the public to send him plastic fragments so he can show the world the new chemistry of our oceans.



Capt. Charles Moore

Discovered the Pacific Garbage Patch.

Aboard the ORV Alguita, Captain Charles Moore sailed from Hawaii to California in 1999 and discovered a never-ending trail of microplastic particles across the ocean surface. This area became known as the "Great Pacific Garbage Patch".

# PLASTIC FACE CASTS



## A million small items makes a mountain of trash

Small single-plastic products with no recovery plan add up to large amounts of plastic in the sea. Made from 1000 single-use coffee stir sticks, this mask shows the significance of incremental loss of plastic to the environment. Every day billions of single-use, throw-away plastic items are consumed, and a small trickle are lost to the ground. Some make it to the sea, where they reside in the gyres.



## MINAR

His name is Minar, from Delhi, India, one of millions of people commonly called "wastepickers" picking up plastic trash to make a living. His insights are invaluable. He claims that "If you design for recycling, I'll pick it up before it gets to the ocean."



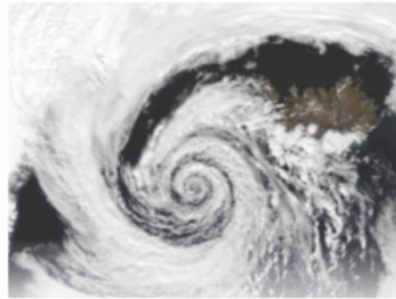
## JACK JOHNSON – SINGER/SONGWRITER, OCEAN ADVOCATE

In 2015 Jack Johnson joined a crew of 40 sailors, scientists, educators, activists, and business leaders to study microplastic in the North Atlantic Subtropical Gyre. On the eve of the voyage the United Nations Environment Program honored as a UNEP Goodwill Ambassador for his contributions to people and the planet.



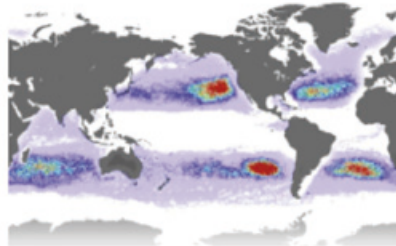
# BANNERS

## PLASTIC IN THE 5 GYRES



### WHAT IS A GYRE?

A gyre is large system of rotating ocean currents caused by the Coriolis Effect, horizontal and vertical friction of wind, which cause frictional ocean surface currents towards the center.



### WHERE ARE THE GARBAGE PATCHES?

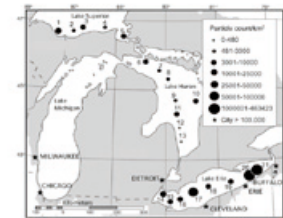


## GREAT LAKES SUCCESS

### The Expedition



### The Science



### The Solution



These free-standing banners are 2'x5' and pull up from the floor.

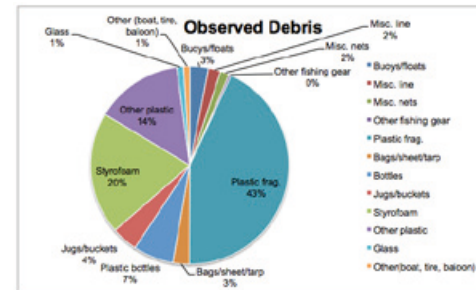
# DERELICT NET BOLUS

A fishing net lost to sea doesn't stop fishing. This net had three dead fish tangled in the synthetic webbing. This net bolus was discovered in the N. Pacific in 2012. There were 36 species identified living in the net. 89 different kinds of rope and line, and five different nets, were tangled in a mass weighing over 500lbs. The net, now weighing 100lbs, can hang from the ceiling, wall anchor, or be draped over the floor.

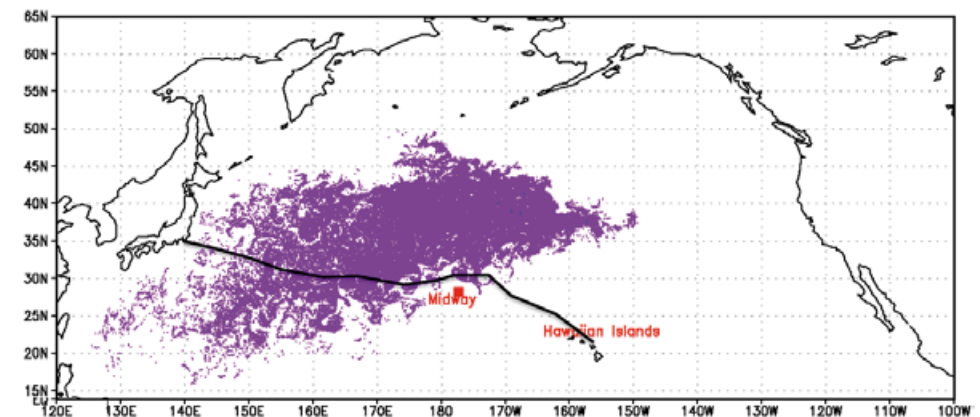




# 2011 JAPANESE TSUNAMI FISHING BOAT



During our 2012 Japanese Tsunami Debris Field Expedition The 5 Gyres Institute collected research samples of plastic pollution and other debris, including a Japanese fishing boat drifting across the North Pacific on its way to N. America. The North Pacific Gyre currents will take tsunami debris to N. America and back to Asia in a 10,000 mile, 10 yr. loop. What's left behind a year later is mostly plastic.



# GYRE SAMPLE

## LARGE TAPESTRY

Artist Mandy Barker has photographed nature's interactions with synthetic forms, like this 9'x12' tapestry of one sea surface sample collected during an expedition in 2012 across the Japanese Tsunami Debris Field. Plastic and life are comingled.



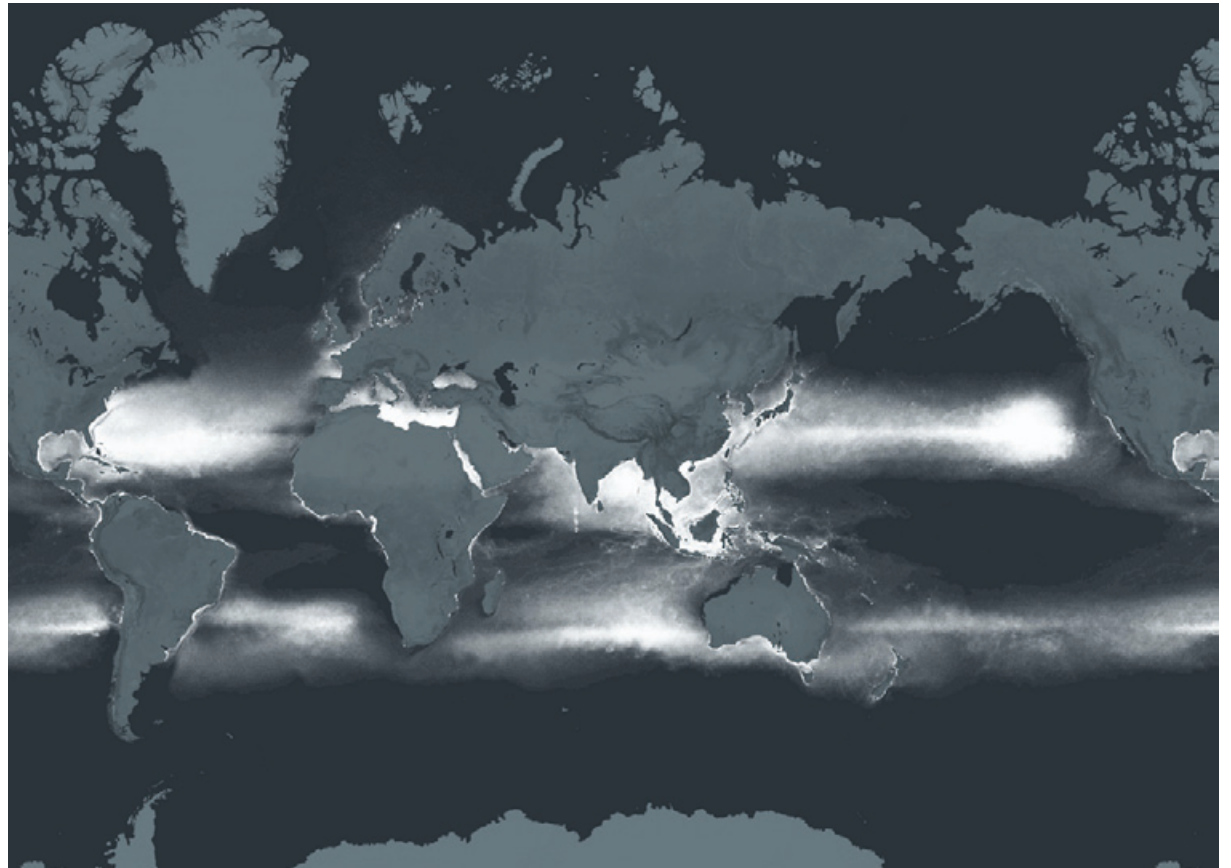


# SMOG OF THE SEA

## LARGE TAPESTRY

The first estimate of all plastic floating in all oceans amounted to 5.25 trillion particles weighing 269,000 tons. 92% of the count comes from particles less than 5mm in diameter. This wide distribution of a tiny particulate, with its toxic capacity, has been described as a "Synthetic Smog", much like the air pollution hovering over some polluted cities.

The 10'x8' tapestry below comes from the work of the authors of the 2014 published research on the global estimate.



# ECOLOGICAL IMPACTS

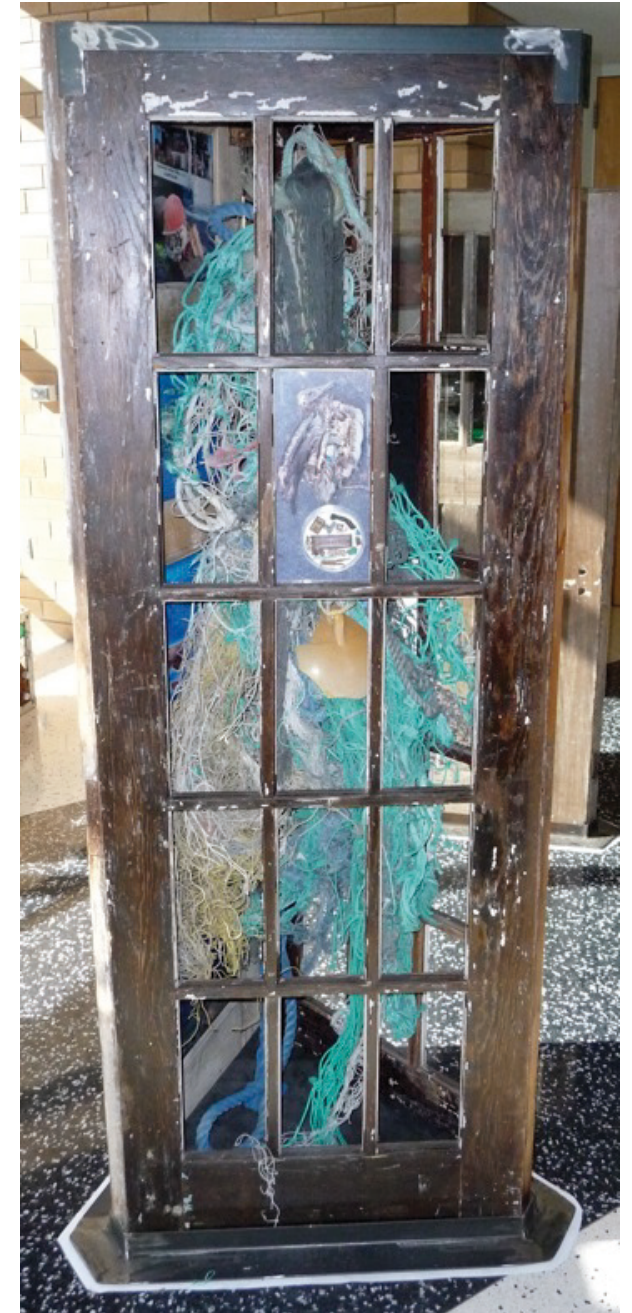
## KIOSK 1

Three salvaged doors make a 3-sided kiosk with a net bolus found in the middle of the Pacific Ocean dangling in the middle.

**Side 1** is all windows, with a photo of a Laysan Albatross in the center. The real stomach contents, collected from Midway Atoll, are displayed on the photo.

**Side 2** is all windows, with a photo of a fish in the center. This fish was collected during the JUNK RAFT expedition in the middle of the Pacific Ocean. The plastic fragments found in the fish's stomach are displayed on the photo.

**Side 3** is a solid door with 5 large photographs of marine life and plastic pollution.





# JUNK in GYRES

## KIOSK 2

Samples from the 5 subtropical gyres show the fate of plastic pollution that washes down our watersheds. From the tops of mountains to the middle of deserts, plastic pollution flows downhill. The ocean is downhill from everywhere.

**Side 1** allows the visitor to spin real samples of plastic pollution from the 5 gyres. Panels below describe what a gyre is and where they are.

**Side 2** describes the JUNK RAFT expedition.

**Side 3** describes the path of plastic pollution from land to sea.



# SYNTHETIC EQUILIBRIUM



The balance of the biosphere is shifting as life adapts to plastic pollution.

This large mobile consists of a 25lb tangled ball of netting found drifting near Japan, a 20lb mass of plastic bags extracted from a camel skeleton in Dubai, and 200 cigarette lighters pulled from albatross skeletons on Midway Atoll.

The entire biosphere is adapting to an influx of synthetic chemistry, resetting the ecological balance. All life reacts to this new material, becoming entangled, ingesting fragments of plastics, population ranges shift, and ecotoxicological impacts emerge. A new equilibrium is in motion.





NET BOLUS



CAMEL GASTROLITH



LIGHTERS

Dimensions: 9ft. x 6ft.  
Weight: All objects and metal armature – 60lbs.  
Metal armature: The two poles, wires and harnesses are all sailing rigging. It's overengineered to support more than 10x its weight.



# BRIDGING THE GREAT DIVIDE



The exhibit is a stack bricks made from plastic waste recovered from the world's oceans and coastlines during our global expeditions. Between conservationists and industry there are philosophical divisions about how to solve the problem. One side emphasizes eliminating the most polluting plastics and improve recycling and composting of all other waste, while the other side resists policies that restrict design and advocate for energy recovery through incineration. The question posed to visitors is „how can we break this wall to find a common solution? Visitors are invited to put their comments on an index card and pin it to a board next to this large wall of bricks.





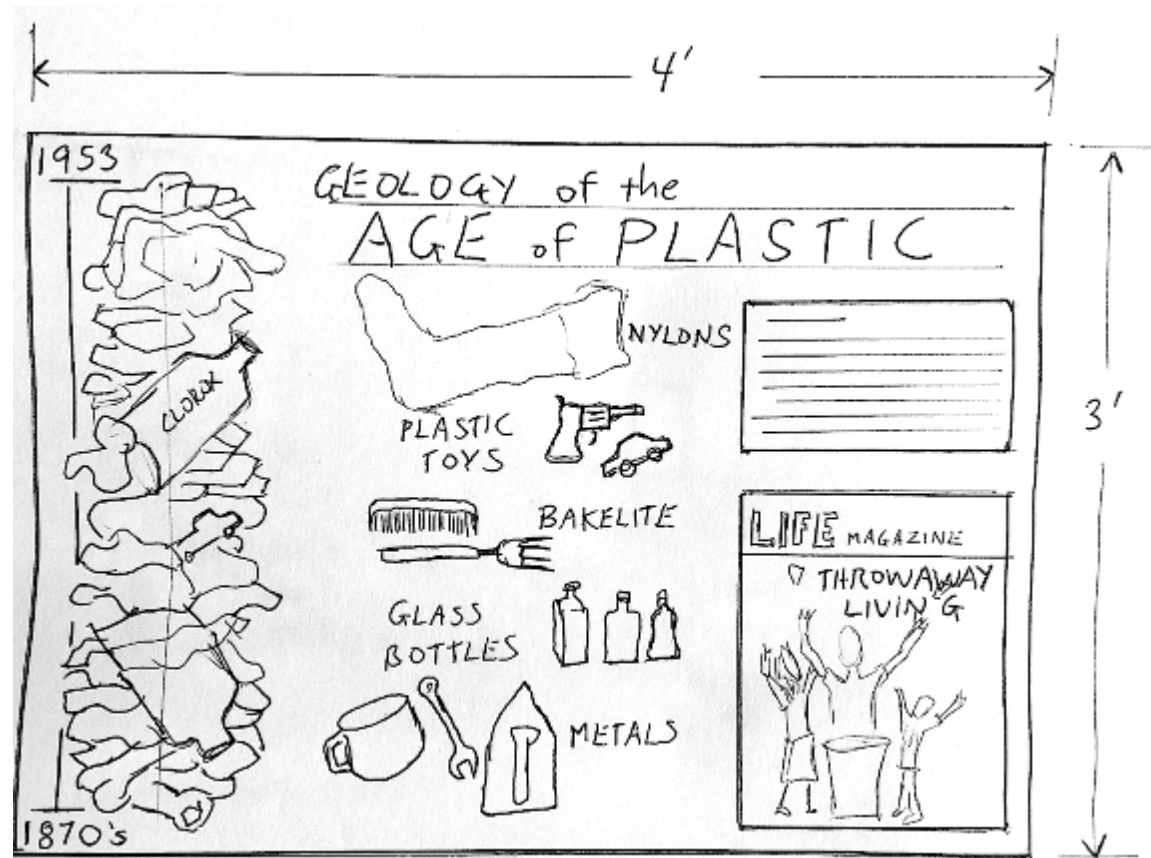
# THROW AWAY LIVING

## (COMING SOON)

On the left is a cross-section of the exposed NYC landfill called „Dead Horse Bay”, located in Brooklyn, it opened in the late 1800's and closed in 1953. It captures the time in US history when the era of conservation transforms into the Throw Away culture following WWII. Unfortunately, this landfill is exposed to the sea, littering the beach with thousands of bottles and broken antiques.

The exhibit will contain a 3ft cross-section of the landfill itself. It's mounted to a wall with a 3'x3' photo of the exposed landfill and beach as the background. 10 artifacts are mounted to the photo and represent the transition in materials from metal and glass to plastic. It's like a geologic column with the youngest material on top. In this display, the object on top is a pair of pantyhose, the first throwaway product to enter domestic households nationally after WWII, just before the Dead Horse Bay landfill closed.

A copy of LIFE Magazine 1955, with the article "Throw Away Living" is displayed in the lower right corner.





# LEAP LAB

The Science of a Sustainable Future

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