

# THE WATERPOD PROJECT

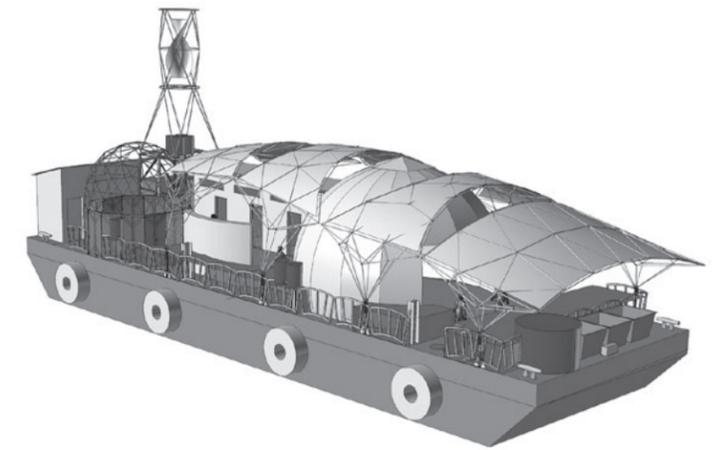
**THE WATERPOD** The Waterpod was a floating, sculptural structure designed as a futuristic habitat and an experimental platform for assessing the design and efficacy of autonomous living systems.

The Waterpod illustrates a future with increased ecological instability and fosters global community-based gathering spaces.

A New York-based multinational team, led by founder and artistic director Mary Mattingly, drew upon the talents of artists, designers, builders, civic activists, scientists, environmentalists, and marine engineers to bring this cross-disciplinary collaboration to fruition in the waterways of New York City. During a global recession and within strict government guidelines, the Waterpod managed to achieve new ways of community outreach, resource sharing, and art creation.



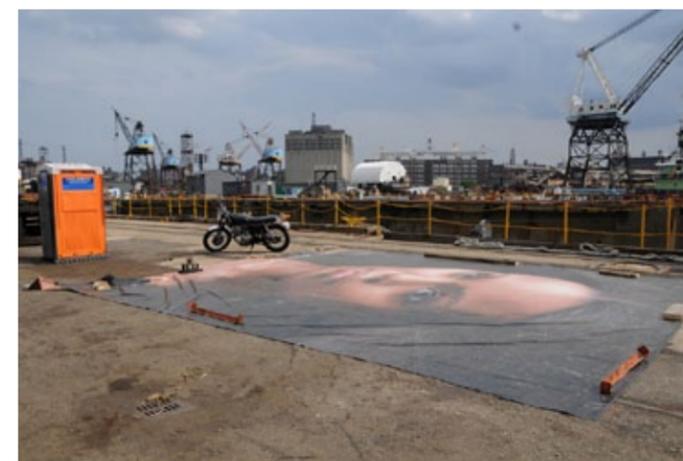
**OPEN TO THE PUBLIC**, it visited all five boroughs at ten different piers for two weeks at a time during the summer and fall of 2009, with over 200,000 people visiting the Waterpod from around the world; including school groups, camp groups, and the general public. Through word-of-mouth and no formal advertising, the Waterpod generated media coverage in more than 300 leading global newspapers and magazines, and 12 television networks in the USA and abroad.



## CONSTRUCTION: RECYCLED MATERIALS

One of the goals of the project is to show that reused construction materials can be made into functional, safe, and aesthetically pleasing structures. In the future, builders worldwide may be limited to using recycled materials. The Waterpod is an experiment in creatively using available, local reused materials from the New York Waste Stream:

- The dome covers were constructed Waterpod's from repurposed billboard vinyl.
- The soil was made in the Bronx from compost and sand, tested and donated from the New York City Department of Parks and Recreation.
- Construction materials also included salvaged pieces of sunken vessels raised from the rivers bottom in the Rockaway and other areas.
- Additional materials were collected from reuse organizations local to New York City including Wastematch.org, Materials for the Arts, a NYC DCA Organization, the Parks Department, NY, Special Projects Management, and SIMS Metal Management.



# ART, SCIENCE, ECOLOGY



**THE WATERPOD PROVIDES SPACE FOR:** (I) community and artistic activity; (II) eco-initiatives including food grown with filtered rainwater; and (III) living space. It provides a model for mobile vessels that can provide relief to cities and countries struck by environmental and political disasters, as well as a model for reshaping suburban landscapes to be a self-sustaining living system.

The methods that make up the Waterpod provide people with necessary systems for rotational food supply, seasonal seed collection and soil-renewing compost, potable water, and mobile shelter with minimal upkeep.



**THE WATERPOD'S FIRST TOUR PRODUCED:** charts of energy use and energy production through solar, hydro, and bicycle power, using the electronic equipment on board; documents describing gardening and composting plans and analysis of the factors to grow food sufficient to sustain five people; a list of appropriate technologies on board and their results, including Pot to Pot Refrigerators, a Pico-hydro generator, bicycle-powered generators, a solar thermally-pumped hydroponic system, a dry composting toilet, solar cookers, a water cone, rainwater catchment systems, natural grey water purification, and a water desalination and purification system; a detailed list of the numerous forms of energy expended in the preparation/creation of the Waterpod, including complete plans for building a Waterpod living system.



**MERGING SCIENCE WITH ART,** the Waterpod highlights: art exhibits, installations, photography, video art, sculpture, digital media projections powered by bicycle, dance, music, interactive performances, author readings, and other cultural events.



**SCIENTIFIC EXHIBITS ADDRESS:** global climate change; sea-level rise; urban overcrowdedness; the future of maritime cities and migration patterns; maritime navigation; mapping cities and waterways; water purification; measuring air quality; using the sextant and the astrolabe to determine position; sub-sea mapping of New York Harbor; sustainable technologies workshops; growing food in reused containers; creating sub-irrigated planters from recycled 2-liter bottles; creating efficient hydroponic systems powered by the water's motion; rainwater collection and reuse; grey water reuse; and estuarial currents as power sources.



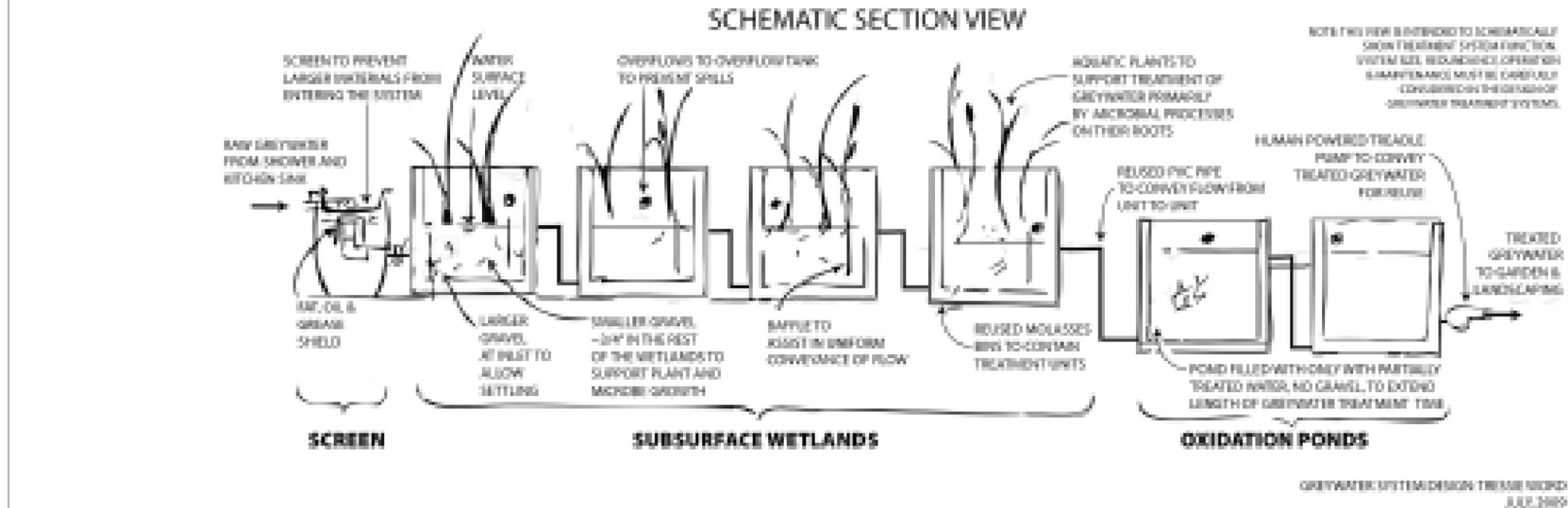
THE WATERPOD

# A CLOSED ECOSYSTEM

## FOOD SYSTEMS AND SUPPLY

The Waterpod's food systems consist of 4 permaculture-designed gardens totaling 400 sq feet of growing space for organic edible plants. For the first voyage, the Waterpod was able to feed the 5 residents and an average of 3 additional mealtime guests daily three meals a day for 5 months. Additional growing systems include outdoor hanging gardens, window farms, hydroponics, xeri-scaping for demonstrational purposes and medicinal value, as well as sub-irrigation planters. These systems used local, heirloom seeds, clippings and cuttings from local Botanical Gardens, purchasing Seed Bank Seeds from Ulster County organization, bringing local lore from featuring historical species.

Using companion planting methods encourages a wide and plentiful range of fruit, vegetable and flower species so that little to no pesticides are needed. The Waterpod gardens introduce diversity and native plants to encourage local pollinators by planting flowers, herbs, and native plants. The Waterpod also houses four hens. The hens each produce roughly an egg a day and eat from the gardens. To fertilize the gardens chicken feces compost is used (made on site) as well algae grown in greywater tanks.



## WATER SYSTEMS

Rainwater is collected for drinking, showering, washing dishes and clothes, and watering the plants. Filtered grey water is also used to water the plants.



Water collection tanks collect water from the rooftops of each structure. A pump sends the water through an advanced filtration system, and stored in an elevated 55 gallon drum, where it can be gravity-fed into a low-flow shower and kitchen sink water system. Residential use was between 55 - 75 gallons of water a day total.

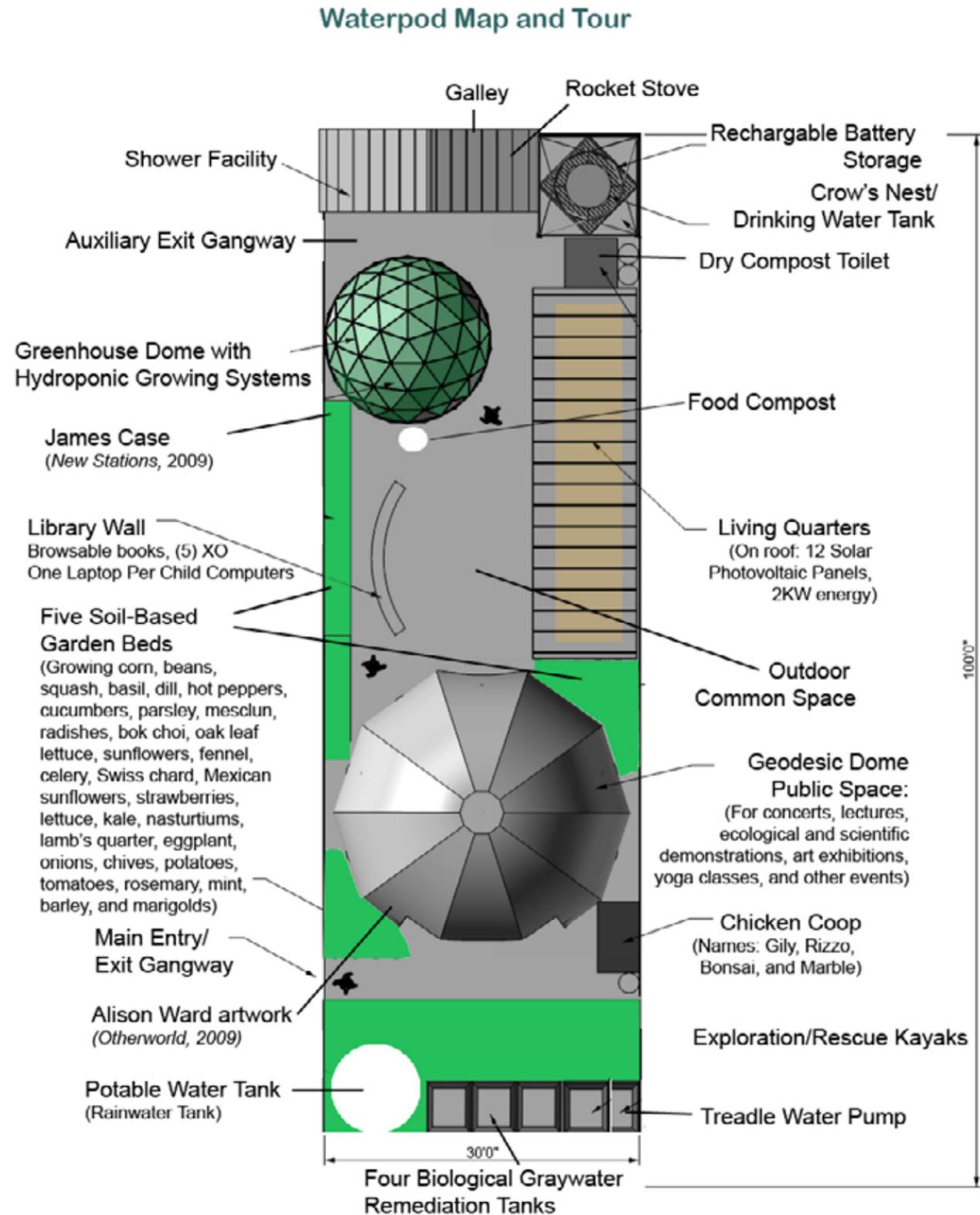
THE WATERPOD

# EDUCATION AND ECOLOGY

## EDUCATION AND COMMUNITY BUILDING

Forming global collaborations and citywide alliances with community boards, government, businesses and individuals is an important facet of what the Waterpod provides.

Educational workshops for connecting food networks within and beyond each borough were hosted on the Waterpod by CENYC. Community Garden networks were formed at workshops on the Waterpod hosted by different community board members. Going forward, this network would be extended to different cities that the Waterpod will travel to.



## SUSTAINABLE ECOLOGICAL TECHNOLOGIES ON THE WATERPOD INCLUDED:

- Twelve Solar Panels on the roof of living quarters.
- Rain Water Purification to Purify the Captured Water
- Bike Electrical Power for Powering Extra Loads
- Picohydro system for Extracting Energy from the River
- Composting Toilets for Processing waste
- Rocket Stove for Cooking Efficiently
- Solar Parabolic Cooker
- Groundless Food Systems
- Simple Hydroponic System for Growing Some of the Food Needed by the Occupants
- Chicken Living Systems

## THE WATERPOD'S FUTURE MODEL WILL INCLUDE:

- Wind Band for power
- Greenhouse technologies for year-round growing
- Hydro turbine technology
- Updated composting systems
- Perennial gardens
- The latest in technologies worldwide

THE WATERPOD

# THE RESULTS

## Food Results:

(per 1 pound of produce)

1. Land: At two pounds per square feet, the Waterpod team did two rotations in the gardens, so with each rotation over the course of five months, we averaged two pounds. We brought in plants as seedlings for both rotations and added compost to the soil between rotations.

2. Water: Over the five-month project, Waterpod residents used an average of 20 gallons a day to water the gardens, accounting for rain days. We used 3,000 gallons of our cleaned greywater and purified rain water on the gardens.

3. Energy: KWH. The energy used consisted of a human powered treadle pump, used on average 1 time daily for 15 minutes, and an electric pump powered by solar, used on average 1 time daily for ten minutes which included minimal garden watering and maximal human use (drinking, dish and cloth washing, and showering).

4. CO2: The CO2 footprint involved included trucking one container of gravel and one container of soil from the Bronx to the Brooklyn Navy Yard. This service was donated by the Parks Department. Three trips at 20 miles each. Trucking scrap metal and wood from Midtown (Broadway play sets) to Floyd Bennett Field storage to Brooklyn Navy Yard = five trips in a flat bed truck at 20 miles each. Trucking other supplies and seedlings in a pickup truck = 20 trips 15 miles each. UPS deliveries = three. Three people flew in from California and Texas to help with the build-out.

5. Labor for the gardens: Welder to weld beds onto barge surface, living systems team included 30 volunteer growers crowd-sourced from Facebook and classrooms around NYC, living systems build out team consisted of average five people daily who constructed the garden beds over two weeks. Volunteers growing seedlings spent three months with the seedlings (monitoring them once daily) before they were delivered to the barge.

6. Capital Costs: Total seed cost = \$100, Used billboard tarp to line garden beds \$150. Greywater tanks \$250 for seven tanks. 1,500 gallon potable water storage tank \$650. Tubing for potable water and plumbing parts \$250. Everything else, including soil, gravel, wood, metal for the beds, welding labor was donated.

7. Weight: 100 pounds per square foot, the garden beds sloped and were built into mounds.

## Community Results:

Waterpod has consulted for other water-based projects that merge art, science, and community, including:

MIT's Senseable Cities Laboratory and the Copenhagen World Expo 2018 project

Vito Acconci's Pratt Institute architecture class 2010

Cooper Union School of Architecture Barge Project

Cornell University School of Architecture Floating Habitat in South Korea

ERIKSEN SKAJAA ARKITEKTER

Artist Natalie Jeremijenko's collaborative Amphibious Architecture project in the East River

Artist Raquel Rabinovich's upcoming river-based project.

Waterpod Appropriate Technologies were implemented by the Occupy Wall Street group: [http://www.appropedia.org/Occupy\\_Sustainability](http://www.appropedia.org/Occupy_Sustainability)

Resident Artist Alison Ward and Shane Heinemeier are working on Habitable Spaces, a Sustainable Farm and Artists' Residency Program in Texas.

Waterpod data has been exhibited in art and science venues across the United States, Europe, South Korea, and New Zealand.

Lectures about the Waterpod have been given in Canada, the United States, the United Kingdom, South Korea, New Zealand, Italy, Bangladesh, Germany, Guam, and Mexico.

The Waterpod has been documented in books focusing on architecture, design, art, ecology, and science around the world, translated into ten different languages. It has been written about in close to 200 periodicals, magazines, and newspapers.

Waterpod data is being used to design the Flock House project, NYC 2012.

# THE FUTURE

## Future Plans:

The Waterpod is at once a demonstration space and a plan that may be extended to any environment in the country, suburbs, or city. The systems used on the Waterpod are microcosms of designs that would benefit urban development, reducing storm water runoff and providing a template for localized food, water, and energy systems. Mobile Waterpod units may be used to provide relief to cities struck by natural disasters, as well as illustrate plans for suburban landscapes. The basic formula is mobile and interchangeable.

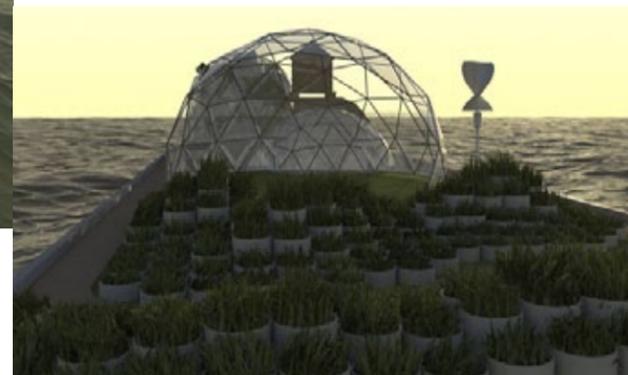
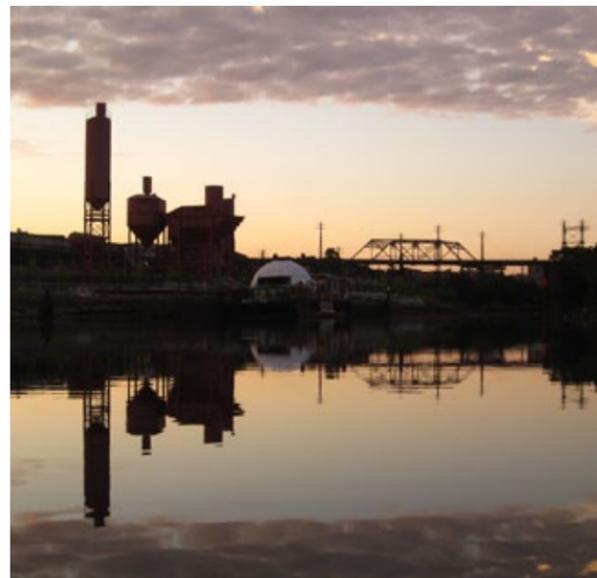
Our focus is to redesign the Waterpod, taking into account everything learned from our first voyage, and creating a second version for the Toronto, 2013.

Our team, including a network of engineers, scientists, ecologists, and roboticists have interpreted the collected data from the Waterpod's test run in the New York Harbor and created plans that augment the systems previously tried to include algae systems, heating and cooling spaces through stored and circulating potable water, new materials that add to the approachability and, in turn, successful outreach of the project!



**IN PREPARATION FOR A WORLD** facing an increase in population, a decrease in usable land, multiple issues involving food and water supply and quality, and challenging environmental conditions, people will need to rely closely on their immediate communities and to explore alternative living models.

The Waterpod operated based on cooperation and collaboration. Throughout its dilatory watery peregrinations, the primary purpose of the Waterpod was to prepare, inform, inspire, provoke, and fortify humanity for tomorrow's exterior voyages.



THE WATERPOD