



FIELD ACTION JOURNAL

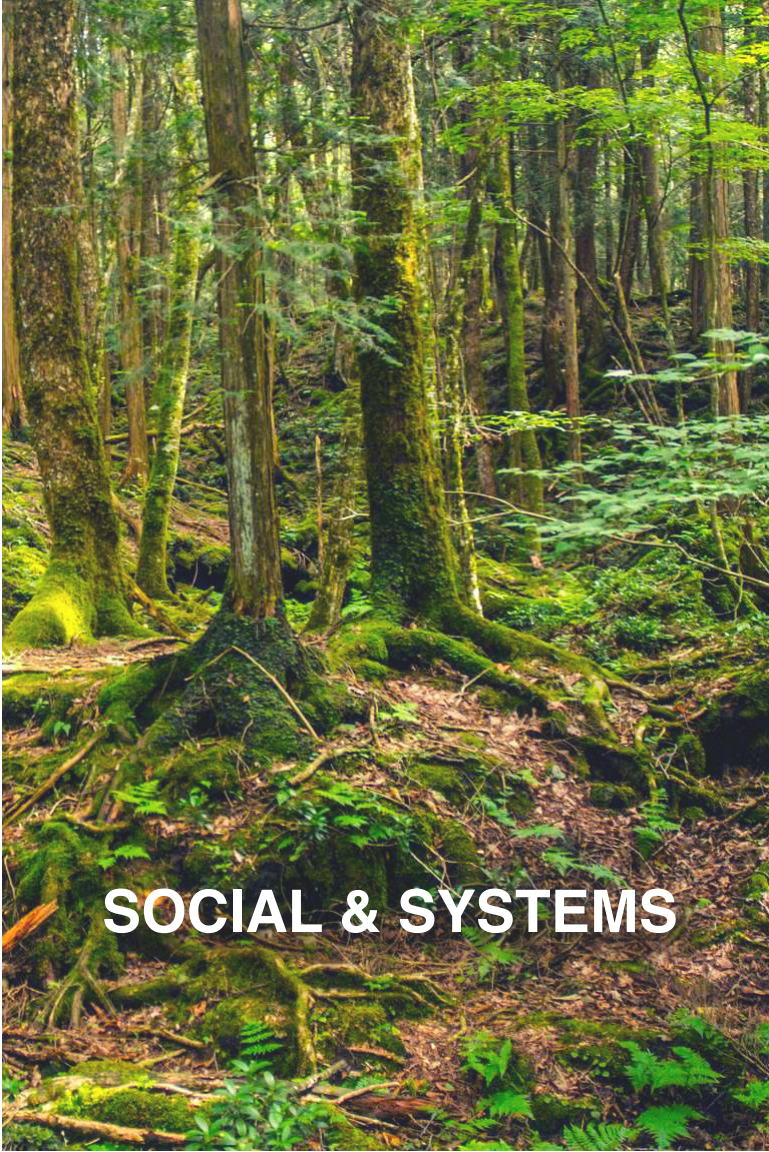
SUSTAINABLE
SYSTEMS

DESIGNING
SUSTAINABLE
NOMADIC
STRUCTURES

Dasha
Iarotskaia

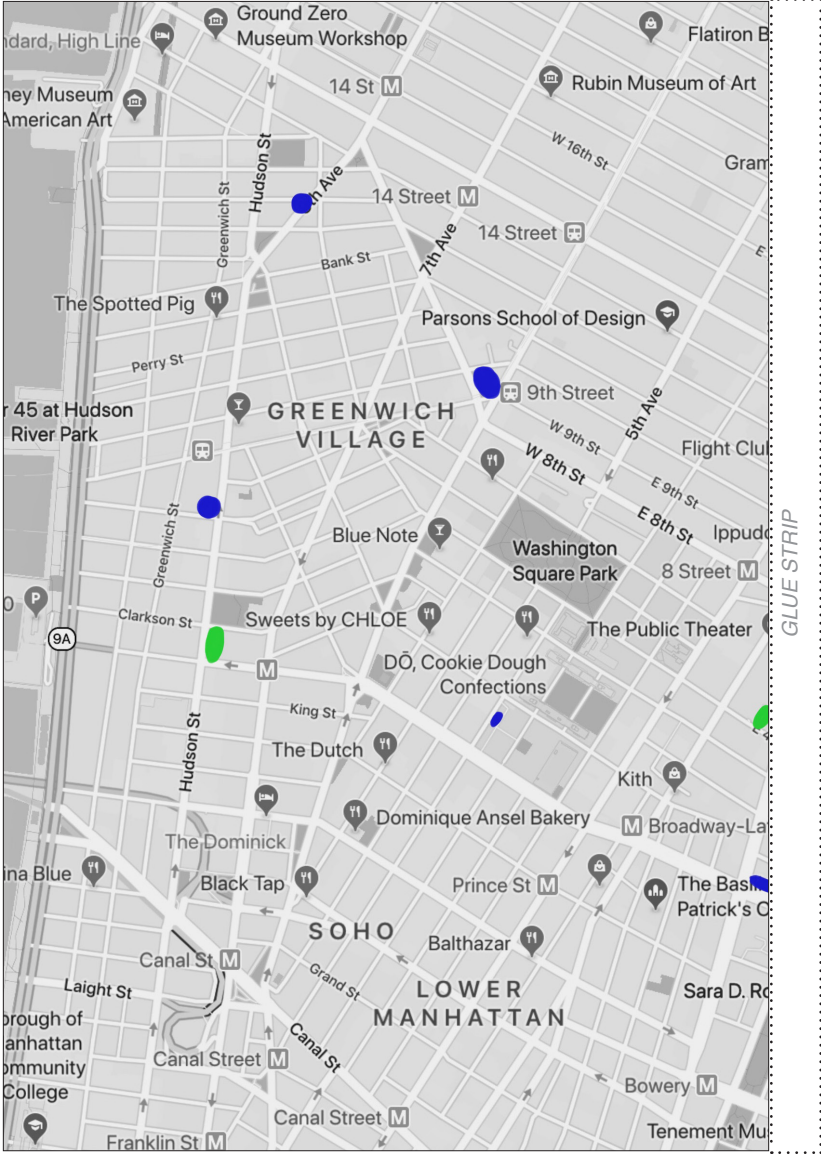
PARSONS THE NEW SCHOOL FOR
DESIGN, SPRING 19
INSTRUCTOR: CAROLIN MEES

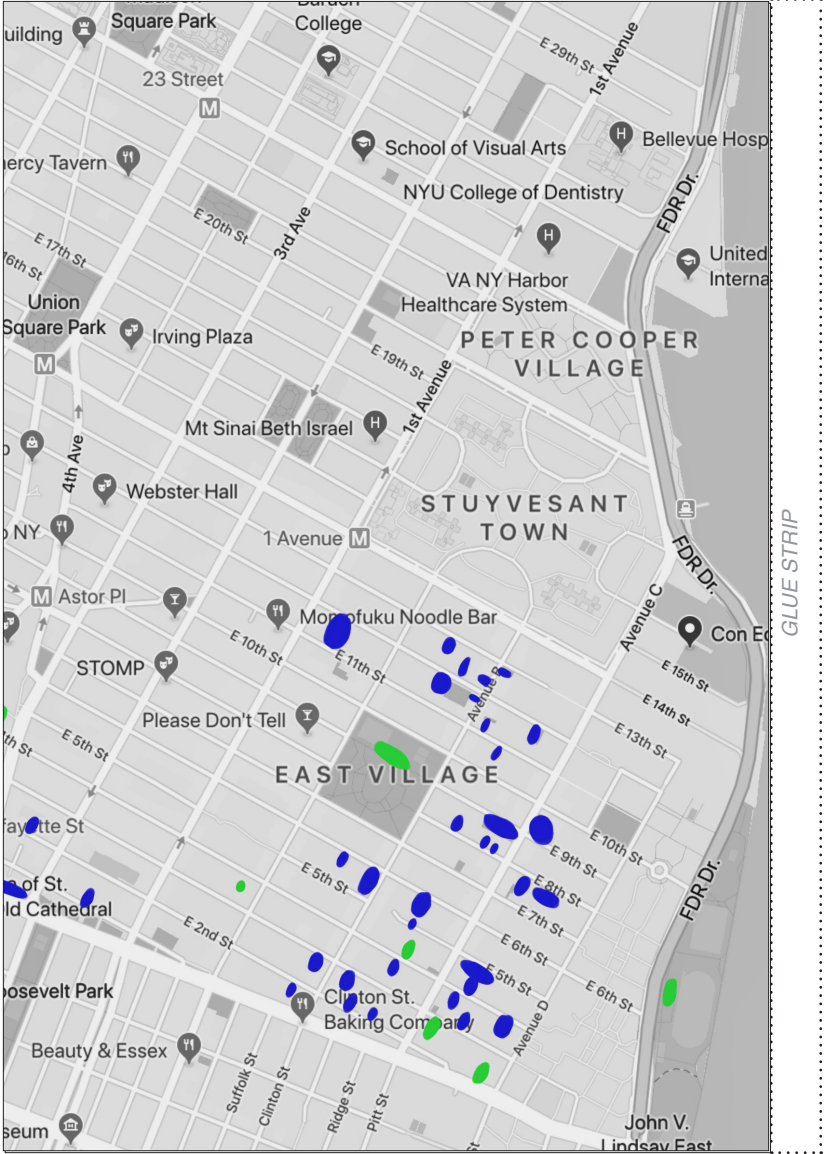
GLUE STRIP



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SOCIAL & SYSTEMS







Overview of the community garden

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Pic. 1 Compost bins
Pic. 2 Frozen pond

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Pic. 1 A place to grow medical plants
Pic. 2 Solar panel pole

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Pic. 1 A bike for producing energy
Pic. 2 Wall displaying the accomplishments

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Wall displaying the accomplishments

Demetrice Mills helps out at the Classon/Fulgate Community Garden in Brooklyn, and serves as president of the Brooklyn-Queens Land Trust. “On some of the blocks—especially the lower-income areas without a lot of investment coming in—people decided to do for themselves,” he says. “The gardens really are the lifeblood of some blocks. They make home values go up, and they make the community safer. People see that every day there’s activity in that space. Criminals are not going to sit around and do crime right in front of you: they’ll move further on down the block.” Mills was one of the first people who started working in the gardens. “I grew up on a farm in North Carolina, ... So I knew how to plant, I knew how to make rows—and I also had organizational skills, people skills, the ability to communicate and to respect other people’s thoughts.” Those skills helped him to get started and to help out others who were interested.

„Rooted in Community, New York City’s Gardens Still Thrive.“ The Trust for Public Land. April 4, 2018. Accessed February 07, 2019. https://www.tpl.org/blog/rooted-community-new-york-city-gardens-still-thrive?gclid=CjwKCAIAqOriBRATeIwAEb9oXID6AEFcPZohAu323ZKJ_xc5myB_qW-df7AwslepPQeHYgBSGUIZG5RoCA9IQAvD_BwE#sm.00000vs41gt4c9ee1qj2lkczktgy.

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Pic. 1 Soaking the seeds in water
Pic. 2 Day 1

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Pic. 1 Day 3
Pic. 2 Day 6

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Conditions necessary to grow wheatgrass:

- sunlight
- warm weather
- watering once a day

It took the plant only two days to sprout, and in a week it was already outgrowing the paper cup.

I think a regular planting pot with holes on the bottom would be a much better solution because if you overwater the plant, it will not drown.

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SCOBY

SCOBY (Symbiotic Community Of Bacteria and Yeast) a living, symbiotic community of bacteria and yeast. This is the culture that transforms the tea/sugar and vinegar mixture into Kombucha leather. Microbial populations in SCOBY cultures vary. The leather produced by the SCOBY isn't the same as animal leather and is composed primarily of cellulose.

Conditions for successful growing:

- undisturbed location
- warm, optimally, the temperature should be above 75F (24 C)

Bacteria acts as a probiotic, thus helping to rebalance proper gut bacteria, this in turn aids in digestion, nutrient absorption, and overall metabolism.

Steps:

1. Brew a strong black tea
2. Add sugar
3. Clean the container you are planning to grow the SCOBY in.
4. Pour the sweet tea in the container
5. Place the SCOBY in the liquid.
6. Cover the container with a lid

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Pic. 1 Day 1
Pic. 2 Day 3

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The SCOBY grew significantly since last week. It covered the whole surface of the container but I think it is still not thick enough to harvest, so I will give it one more week to grow.

The process of growing the SCOBY was very low maintenance after I set everything up, it smells pretty strongly, but I covered it with a trash bag to avoid any spills which seems to also help with the smell.



SCOBY after 2 weeks

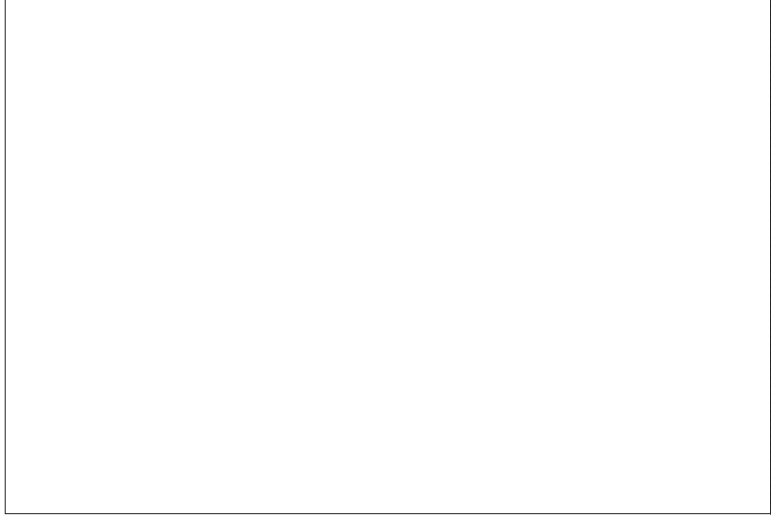
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Electric grid

An electric grid is an interconnected network for delivering electricity from producers to consumers. It consists of

- generating stations that produce electrical power
- high voltage transmission lines that carry power from distant sources to demand centers
- distribution lines that connect individual customers

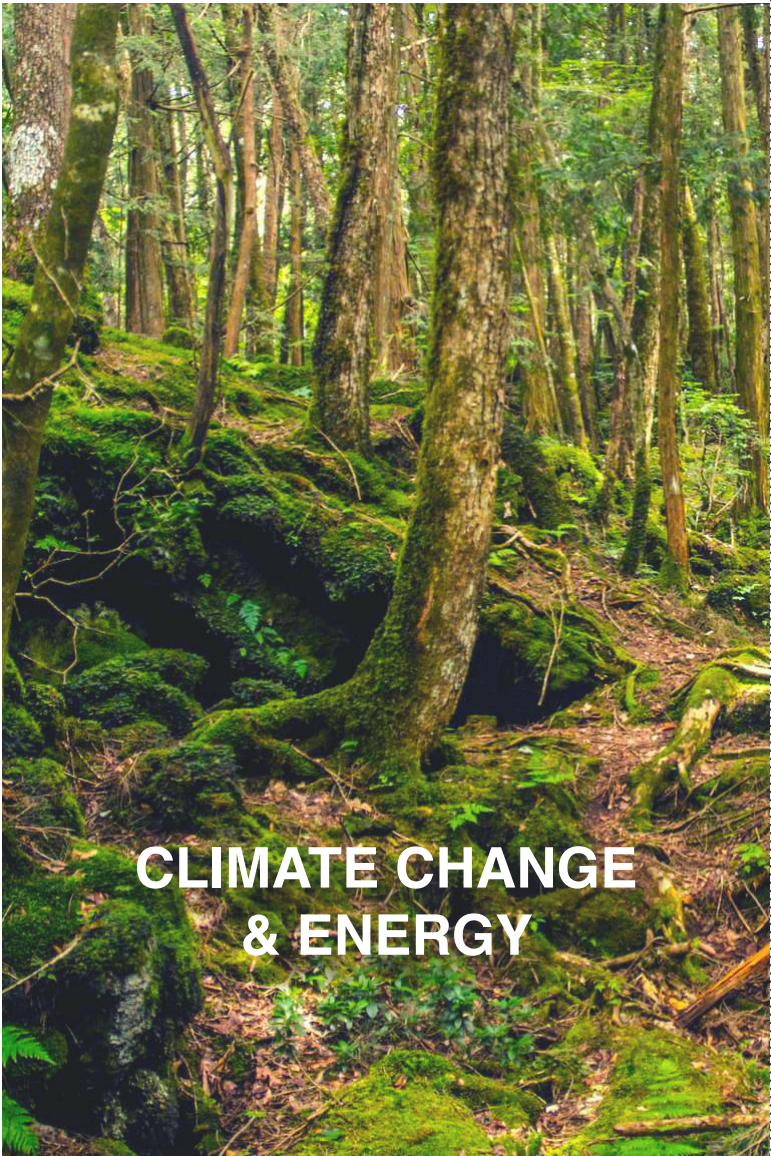
Off-grid energy options:

- solar panels (need direct perpendicular sunlight)
- wind turbines (need constant wind)
- microhydro power system (needs a water stream)

To set up a microgrid you will need:

- a power source (ex. solar panels)
- power management system (handles the transfer of electrical power from the power source to the electricity consuming devices)
- energy storage system (it allows the microgrid to balance the electrical and thereby make the electricity accessible when it is required by the user)
- electricity consuming devices (it is important to consider these devices because they will dictate the electrical loads placed on the microgrid, which in turn will affect the power generating capacity required from the power source and the storage requirements)

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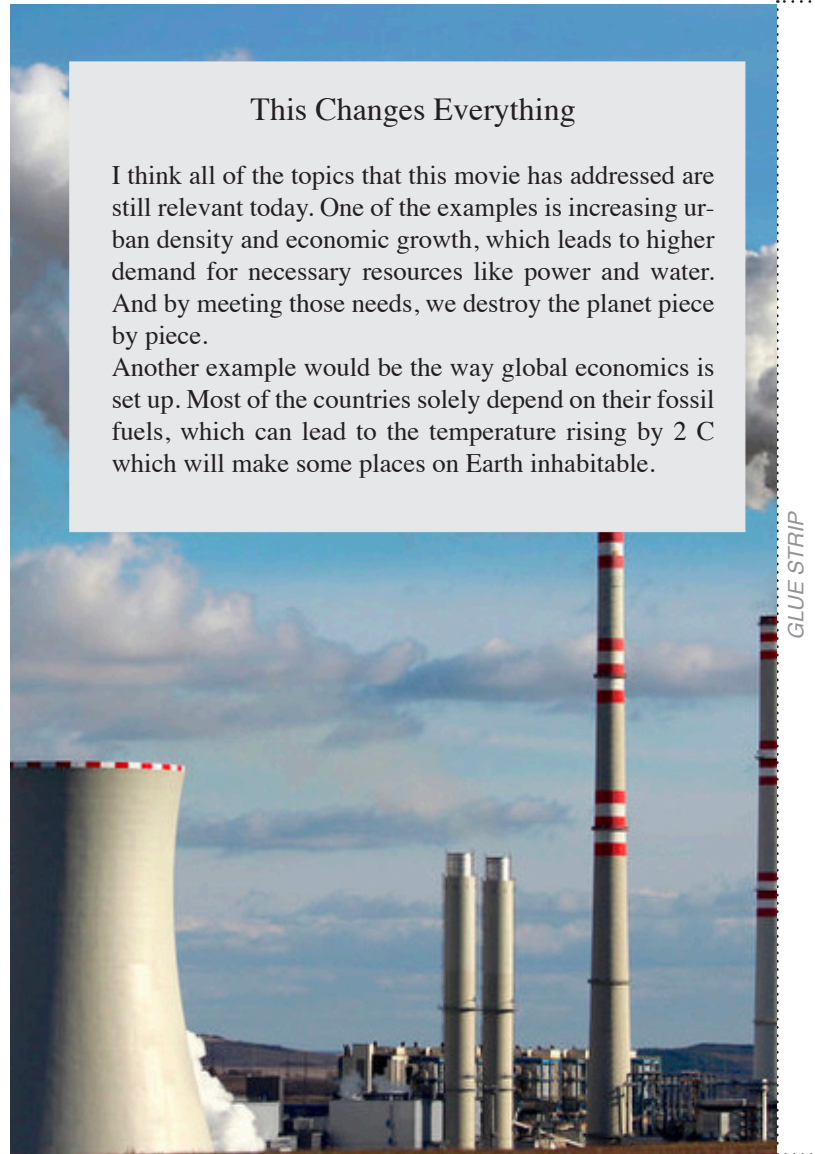
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**CLIMATE CHANGE
& ENERGY**

This Changes Everything

I think all of the topics that this movie has addressed are still relevant today. One of the examples is increasing urban density and economic growth, which leads to higher demand for necessary resources like power and water. And by meeting those needs, we destroy the planet piece by piece.

Another example would be the way global economics is set up. Most of the countries solely depend on their fossil fuels, which can lead to the temperature rising by 2 C which will make some places on Earth inhabitable.



Smog mitigation

There are five ways of purifying air from smog:

- HEPA filters

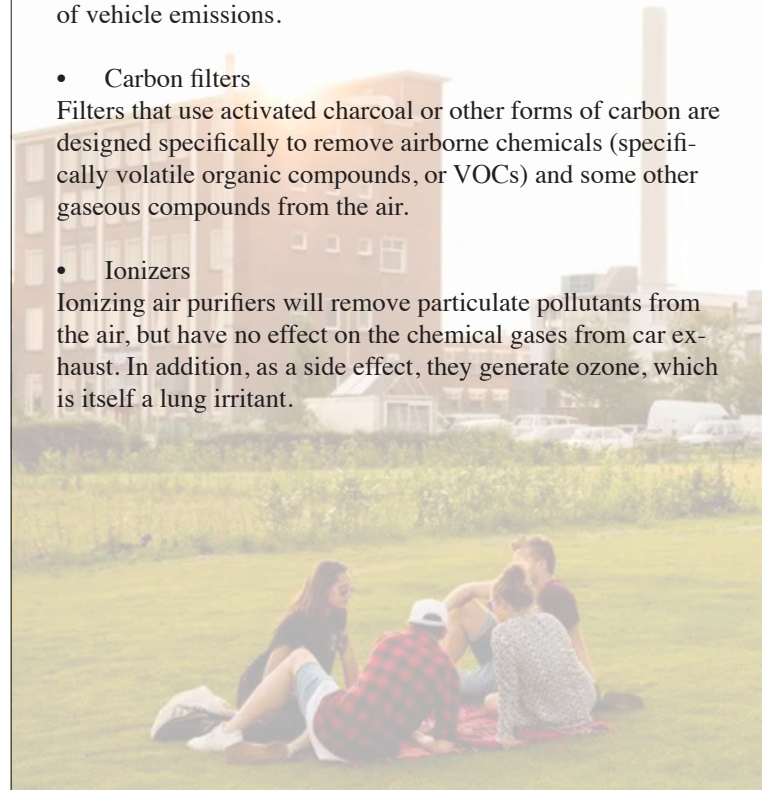
A HEPA filter is built to a specification requiring it to filter out 99.97 percent of all particles at a size of 0.3 microns. This means a HEPA filter is designed to remove PM2.5 pollutants from the air, including tire and brake dust and some elements of vehicle emissions.

- Carbon filters

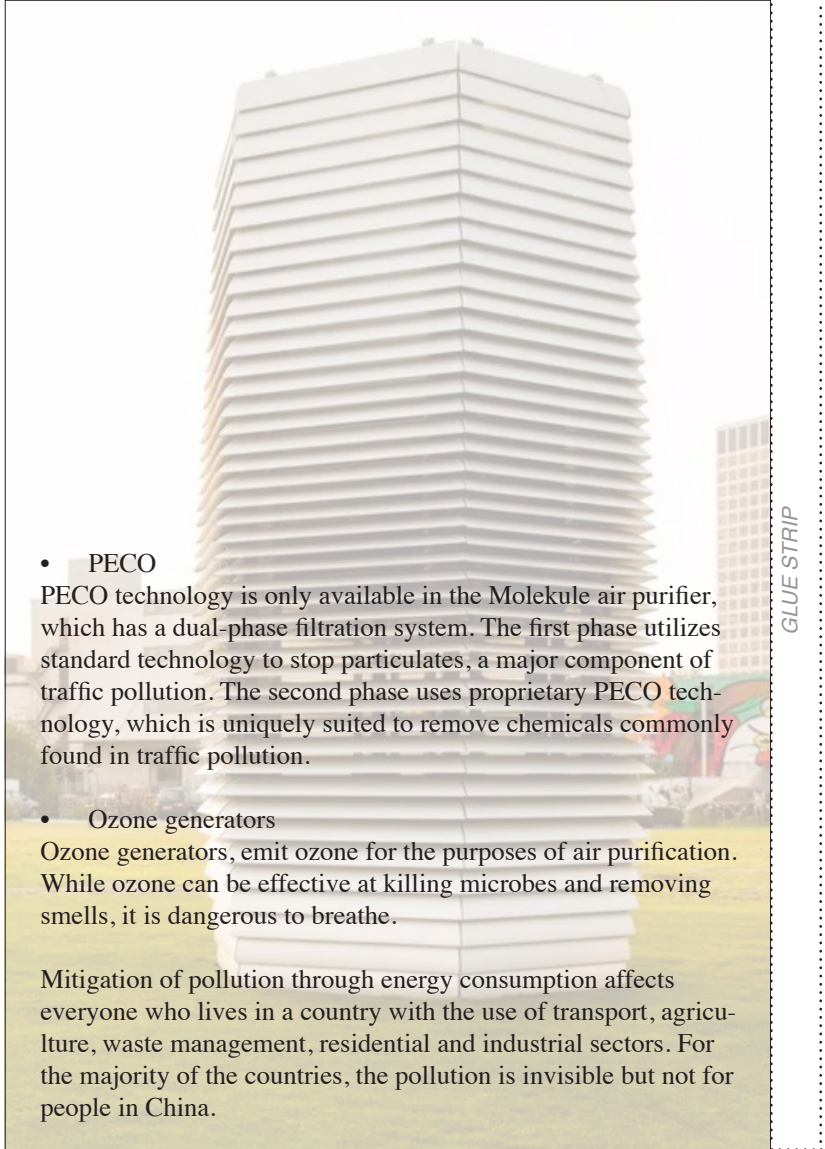
Filters that use activated charcoal or other forms of carbon are designed specifically to remove airborne chemicals (specifically volatile organic compounds, or VOCs) and some other gaseous compounds from the air.

- Ionizers

Ionizing air purifiers will remove particulate pollutants from the air, but have no effect on the chemical gases from car exhaust. In addition, as a side effect, they generate ozone, which is itself a lung irritant.



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- PECO
PECO technology is only available in the Molekule air purifier, which has a dual-phase filtration system. The first phase utilizes standard technology to stop particulates, a major component of traffic pollution. The second phase uses proprietary PECO technology, which is uniquely suited to remove chemicals commonly found in traffic pollution.

- Ozone generators
Ozone generators, emit ozone for the purposes of air purification. While ozone can be effective at killing microbes and removing smells, it is dangerous to breathe.

Mitigation of pollution through energy consumption affects everyone who lives in a country with the use of transport, agriculture, waste management, residential and industrial sectors. For the majority of the countries, the pollution is invisible but not for people in China.

United Nations field trip

After listening to all of the speeches, I believe Timo Rissanen's was the most powerful one. He talked about fast fashion and how stores like H&M and Forever 21 overproduce cheap clothes which sometimes cause people their lives. But what I found even more shocking was the fact that high-end brands like Burberry burn their clothes so they would not go on sale thus keeping the brand's reputation intact. If before I did not fully understand why there is so much carbon dioxide is produced now, I see how crazy people can be when their pride and money is at stake.

I believe that with each year more and more people prefer more sustainable brands and in the future, I would definitely try to keep the sustainability factor in mind while creating new products.

zero
waste
fashion
design

B L O O M S B U R Y

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Drought

A **drought** is a natural disaster of below-average precipitation in a given region, resulting in prolonged shortages in the water supply, whether atmospheric, surface water or ground water. A drought can last for months or years, or may be declared after 15 days.

The more that greenhouse gases saturate the atmosphere, the more intense global warming becomes. Climate change is a major causing factor of droughts. It's unfortunate that human activities contribute to the emission of greenhouse gases, which in turn cause the abnormal elevation of global temperatures.

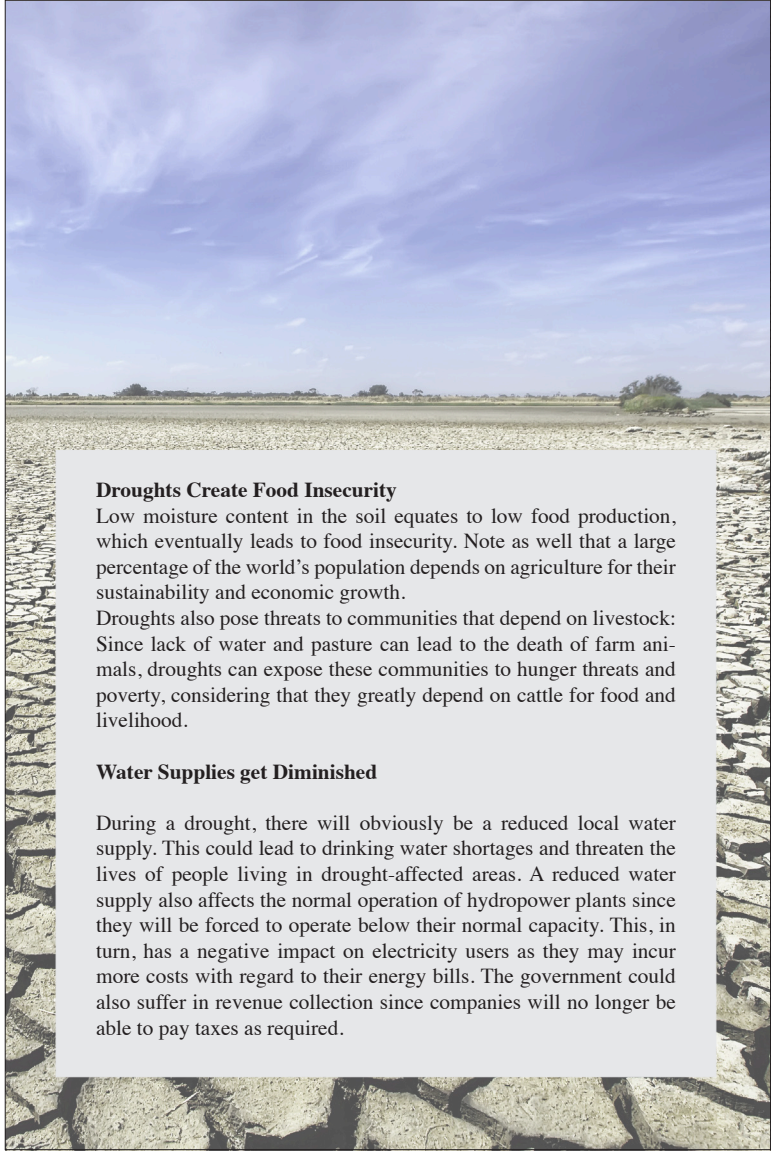
Higher temperatures will obviously lead to dryness and an increased rate of moisture loss from water sources, as well as in the soil. This directly contributes to dry conditions, drier weather, and of course, droughts.

Droughts Contribute to Human Health Problems

When drought sets in, human beings in some parts of the world are forced to share the few available water sources with their livestock and cattle, and some desperate people will even try to drink water intended for irrigation purposes. In most cases, this leads to water contamination and hence the outbreak of diseases like cholera.

It's natural that the human body requires adequate amounts of water to function efficiently, and so lack of water can lead to dehydration and other more complicated health problems like kidney failure.

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Droughts Create Food Insecurity

Low moisture content in the soil equates to low food production, which eventually leads to food insecurity. Note as well that a large percentage of the world's population depends on agriculture for their sustainability and economic growth.

Droughts also pose threats to communities that depend on livestock: Since lack of water and pasture can lead to the death of farm animals, droughts can expose these communities to hunger threats and poverty, considering that they greatly depend on cattle for food and livelihood.

Water Supplies get Diminished

During a drought, there will obviously be a reduced local water supply. This could lead to drinking water shortages and threaten the lives of people living in drought-affected areas. A reduced water supply also affects the normal operation of hydropower plants since they will be forced to operate below their normal capacity. This, in turn, has a negative impact on electricity users as they may incur more costs with regard to their energy bills. The government could also suffer in revenue collection since companies will no longer be able to pay taxes as required.

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Structural

superPan®
FINSA - FINANCIERA MADERERA SA
MC 9023-01

High strength, versatile wood composite board that combines a lightweight, lower cost core with high-quality surfaces on each face. This 90% wood product has a core manufactured from particles of wood such as flakes, chips, shavings, sawdust and similar bonded intimately to surface layers that are manufactured from lignocellulosic fibers under pressure and heat. This creates a panel with high bending strength, high modulus of elasticity, lightweight that can be worked like regular MDF. They are offered in various formats: superPan Std (std board with 1 mm outer fiber layer), superPan H (Moisture resistant), superPan Ign (Fire retardant), superPan Plus (with 1.5 mm fiber layer), superPan Top (with 4 mm fiber layer), superPan Star (lightweight superPan with core made of wood chips and Kaurit), superPan Tech P4; P5, P6 (Technical superPan boards for structural uses), and superPan Decor (melamine faced superPan); available in more than 200 designs and 20 different finishes. Panels are a standard 2850 mm x 2100 mm and 2440 mm x 1220 mm (112 in x 82.7 in and 96.1 in x 48 in) thicknesses of 8 mm to 44 mm (0.31 to 1.73 in). The panels have been tested for and passed: EN 312 general tests for particleboard - SuperPan Tech P4, P5, P6, as well as EN 13501-1 for fire resistance 8 mm ≤ 12 mm class B-s2, d0, 12 mm - 44 mm and 8mm - 44 mm (melamine faced) class B-s1, d0. They are FSC - Forest Stewardship Council (TT-COC-003279), PEFC - Forest Stewardship Council (PEFC/14-35-00006), CARB Phase2 certification (TPC-15) and US EPA TSCA Title VI certification (TPC-15) certified, and can contribute to LEED and BREEM points. The panels are suitable for furniture, decoration, carpentry, shop-fitting, furniture components, house building, formwork, mezzanines and general interior construction.



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Food production

GreenFiber 10 S and Greenfiber 10 SP
Sep-All
MC 9199-02

A family of high-performance 100% nanocellulose staple fibers that are made from different softwoods to create flexible, yet mechanically strong, products for personal care and packaging. The manufacturer has developed a unique method to chemically modify the nanocellulose that is prepared in-house from pulp to suit a wide range of applications including agricultural lubricants and food packaging. This biocompatible material can be used as a stabilizer in food products or to improve the mechanical properties of thermoplastics. It also demonstrates better lubrication properties upon further surface modification with a proprietary coating and can be used as a seed lubricant. According to testing performed by the manufacturer, it has shown improved seed singulation and seed multiples compared to current seed lubricants. It is available in 2 grades: GreenFiber 10S (white) and Greenfiber 10SP (brown) and is sold in 5 gal (640 oz) buckets. The fiber diameter can vary from about 100 to 1,000 nm (0.004 mils to 0.04 mil) and these fibers can come with or without the additional coating. Applications are as additives for food packaging, thermoplastics, personal care products, and for antimicrobial and environmentally-friendly lubricants, insecticides, fungicides, and mildew preventives.

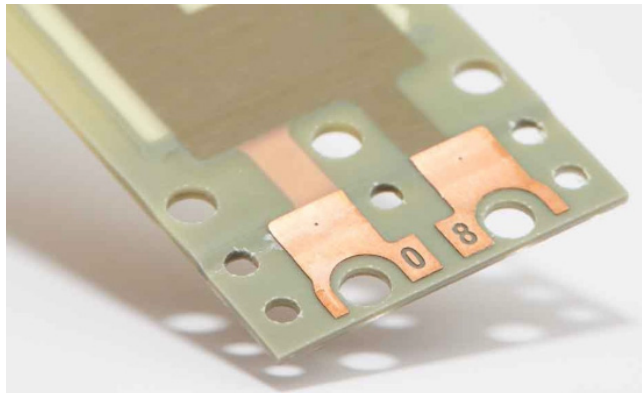


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Solar energy collection or solar energy reflection

PPA- Energy Harvesting
Midé Technology Corp.
MC 7741-01

Packaged piezoelectric transducers that can be used for energy harvesting and general actuating and sensing applications. They are composed of 50% glass-reinforced epoxy laminate (FR4), 25% piezoelectric ceramic, 18% polysulphone and 8% copper. These transducers are produced using a patented manufacturing process that encapsulates high-performance brittle piezo ceramics between copper-clad insulating materials creating a robust, reliable, hermetically sealed and electrically insulated transducer with an easy connection. This allows seamless integration into desired sensor system or application. Piezoelectric materials can be used to convert normally wasted vibration energy in the environment to usable electrical energy to charge a battery, super capacitor, or directly power remote sensor systems. They are offered in 10 different formats, which vary in size, amount of piezo material, energy harvesting power potential, dynamic displacement, block force and static displacement. The standard size ranges from 53 mm x 10.3 mm (2.09 in x 0.41 in) to 71 mm x 41.5 mm (2.8 in x 1.63 in) with options to customize shapes, sizes and natural frequencies. The maximum allowed size is 14 in x 14 in (355.6 mm x 355.6 mm) and the minimum size limit is 0.125 in x 0.125 in (3.18 mm x 3.18 mm). Applications are for sensors, actuators, vibrational energy harvesting and haptic feedback.



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Water proofing and water collection or water drainage

Malai biocomposite
Malai Design & Materials
MC 8774-01

A flexible, leather-like biocomposite sheet based on bacterial cellulose as an alternative to animal hides and their imitations. The company works alongside coconut farmers in Southern India and processing units that find themselves with too much coconut waste water after they have removed the white flesh from inside mature coconuts. Normally, this waste water would be released into drainage systems, but this can cause water pollution and the soil to become acidified in surrounding areas. Instead, the company uses this waste water and places it into vats for sterilization, resulting in an entirely natural, energy-rich nutrient upon which bacterial culture can feed when combined. The fermentation period takes between twelve to fourteen days. At the end of this process, a sheet of cellulose 'jelly' is produced. This jelly undergoes another process of refinement by enriching it with natural fibers, gums, and resins to create a more durable and flexible material. The end product is sustainable, biodegradable, water resistant, and vegan. The material is available in 1.09 yd x 1.09 yd (1 m x 1 m) sheets with a 0.04 in to 0.08 in (1 mm to 2 mm) thickness. It is available in 16 oz to 18 oz (550 gsm to 600 gsm) weight depending on what is most suitable for the material's flexibility and durability; however, weight can be customized upon request. A wide range of colors are made with natural dyes such as indigo, cutch, myrobalan, brazilwood, madder, and turmeric. The material can also be sewn, laser cut, 3D molded, and embossed or printed onto. Applications include fashion, accessories, bags, packaging, stationery, interior surfaces, and furnishings. For future use, this material prior to the refinement stage is very promising in various fields such as the cosmetic industry for making rejuvenating face masks, food industry as a thickener or a dessert, or in the medical industry for developing biocompatible body implants.



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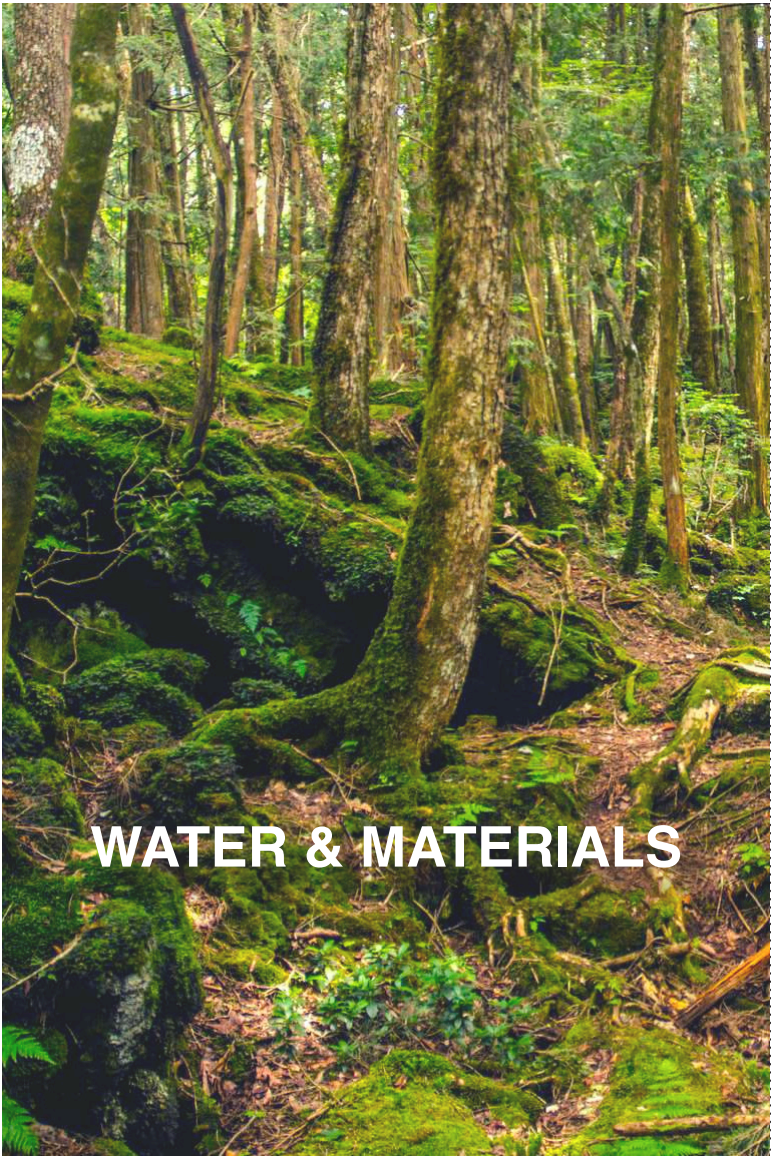
Thermic insulation and cooling

Kapok Insulation
Flocus
MC 7913-01

Soft, lofty kapok/polyester (PET) blends (up to 70% kapok) that are insulating, anti-bacterial, and quick drying. Kapok is a natural fiber from the seed pod of the tropical tree *Ceiba pentandra* that is harvested annually. Kapok is naturally water repellent (hydrophobic) as the fibers have a waxy outer coating. The wax film also repels insects and bacteria, which is beneficial both for kapok cultivation (as kapok does not require pesticides and insecticides) and for performance benefits in the final product. The Kapok fibers are hollow, resulting in a batting that is very lightweight and thermally insulating. Flocus Light is a 70%–30% kapok-recycled polyester blend; Flocus Loft is a 50%–50% kapok-polyester blend; Flocus Green is a 50%–50% kapok-poly(lactic acid) (PLA) blend. Kapok is harvested from the fluffy fiber surrounding the seeds of the tropical kapok tree, also known as the ceiba tree. The fibers are then mixed with PET or PLA and thermally bonded to form sheets of batting, or left as a loose fiber fill. When blended 50/50 with PLA (Flocus Green), the insulation can be a fully biodegradable and potentially compostable filling. The filling is available in weights ranging from 40 gsm (1.2 osy) to 600 gsm (18 osy). Applications include jackets, bedding, sleeping bags, and lined products.



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WATER & MATERIALS

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Water testing

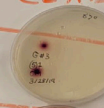
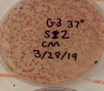

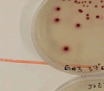
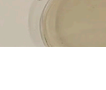
Water testing is a valuable tool which can make people aware of environmental issues such as contamination of waterways and oceans. By testing, we can find out if the water is transporting any diseases which can in the future infect people that drink tap water. As designers, we can be more mindful of that issue and always keep it in mind while we're working on our projects. We can start using more natural fabrics, dyes, etc., which should not contaminate our drinking water because of their clean composition.



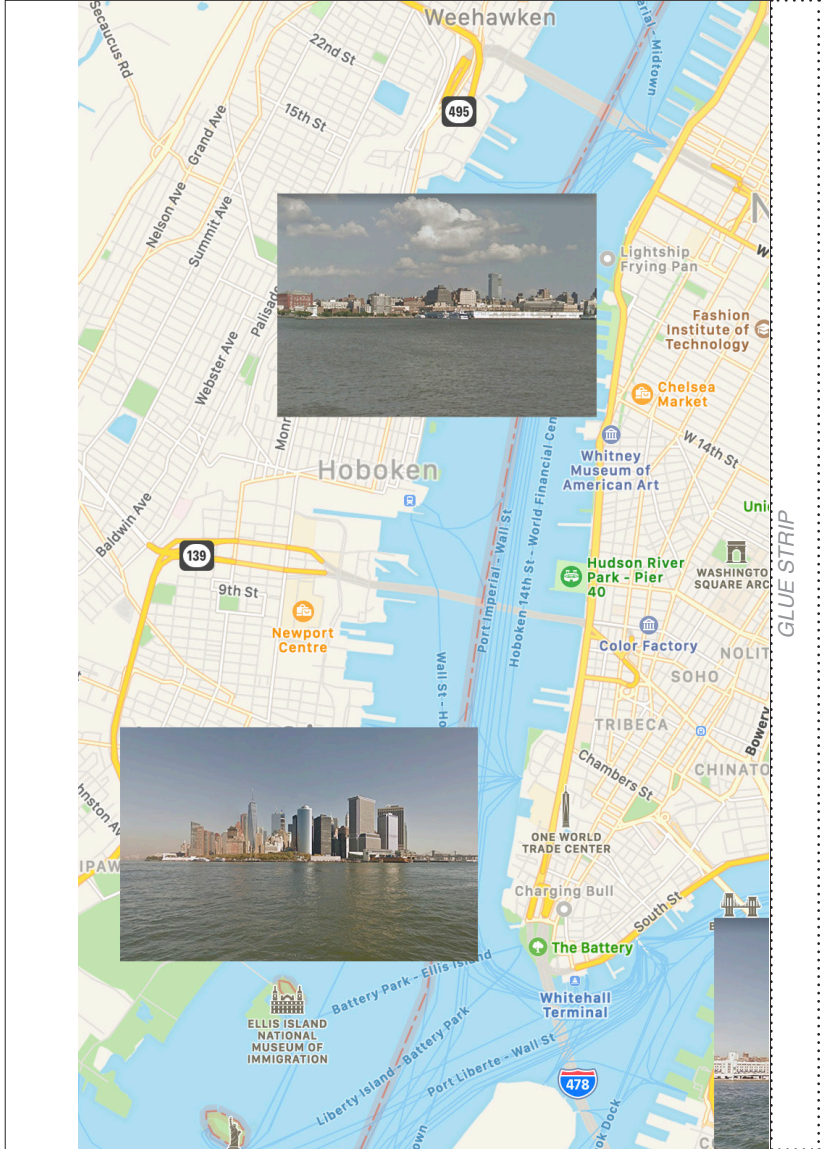
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Combined Sewage Overflow issue

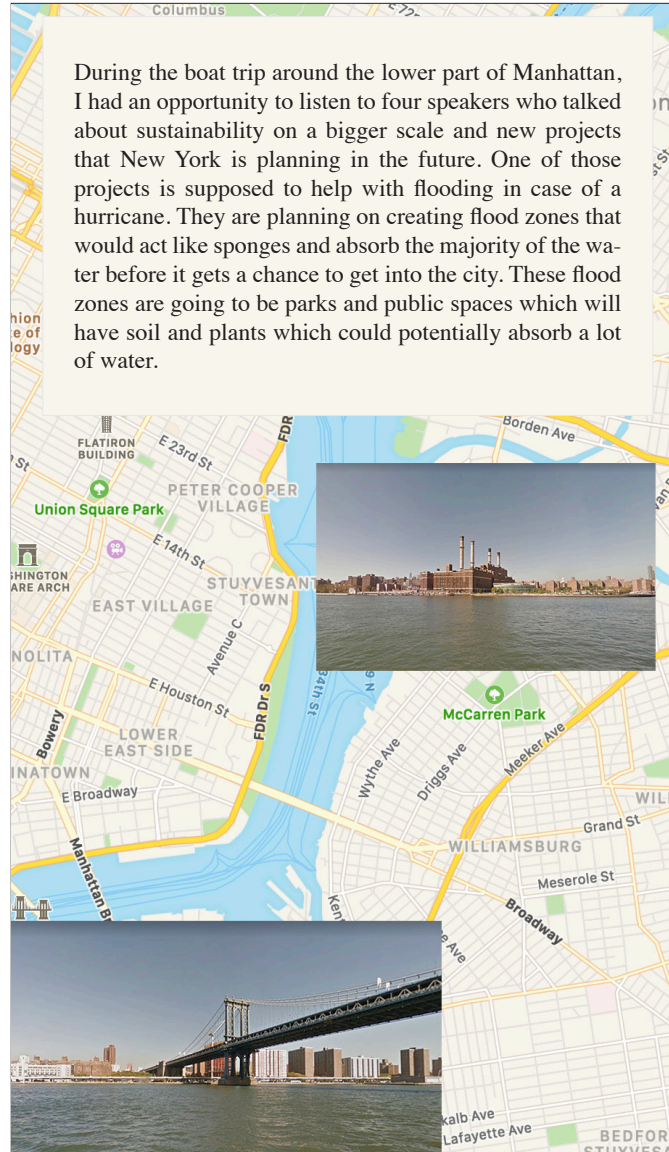
When our group saw what happens when it rains, and the sewer overflows, and we wanted to find the best temporary solution to the problem. We suggested making an extension to the existing pipe to be able to put filters of different diameters inside to filter out water that is overflowing into the river.

	ROLE	PREDICTION	RESULT
STERILE H ₂ O	CONTROL	CLEAR	
CITROBACTER (TC)	R.S.	Pink	
E. COLI (FC)	R.S.	PURPLE	
RIVER SAMPLE	EXPERIMENTAL	Pink/Purple	
FILTERED RIVER SAMPLE	EXPERIMENTAL	CLEAR	

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During the boat trip around the lower part of Manhattan, I had an opportunity to listen to four speakers who talked about sustainability on a bigger scale and new projects that New York is planning in the future. One of those projects is supposed to help with flooding in case of a hurricane. They are planning on creating flood zones that would act like sponges and absorb the majority of the water before it gets a chance to get into the city. These flood zones are going to be parks and public spaces which will have soil and plants which could potentially absorb a lot of water.



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Big U

Last week I went with the class to a public park at the East River in lower Manhattan. We were taken there because the government decided to make it into a flood zone to protect the buildings from hurricanes in the future. It sounds good on paper but in reality, they want to fill the whole space with soil so it would absorb the water, but it will take them about three years to do that which will cause the park to close.

Our group had an opportunity to meet one of the people who help with composting. She told us about how hard it is to do in New York, and then they don't even have enough space for more compost.



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Animals' self-organisation

A pack of wolves usually comprises a dominant (alpha) pair; an individual or a couple following in importance, and most likely to replace the current alphas (referred to as the beta pair); next in line, are individuals in the middle ranks, these are followed by one or more wolves of the lowest (omega) rank. The alpha pair commands the whole group, while the beta pair directs the mid-level wolves, and the adults take charge of the remaining pack members in the middle and lower ranks. While the two extremes of the pack hierarchy tend not to vary, except in cases of injury or death, the average rank is more socially dynamic. The wolf pups remain outside this complex ranking system until the age of sexual maturity, while females always play second fiddle to males of equal rank. This might help the colony I create to separate the power and responsibilities accordingly.

