

Galveston Island

Overview

Located at 29.3013° North, 94.7977° West along the Texas Coast on the Gulf Of Mexico with hot and oppressive summers; the winters are short, calm, and windy; the climate is wet and partly cloudy year-round. The temperature varies from 49°F to 93°F. The population in 2022 was 50,307. Today the population has increased to 262,556. As a result of adaptations and mitigations, scientists developed methods to overcome rising sea levels resulting in a modern tourist destination that ranks among the top ten in the world.

Closer Look

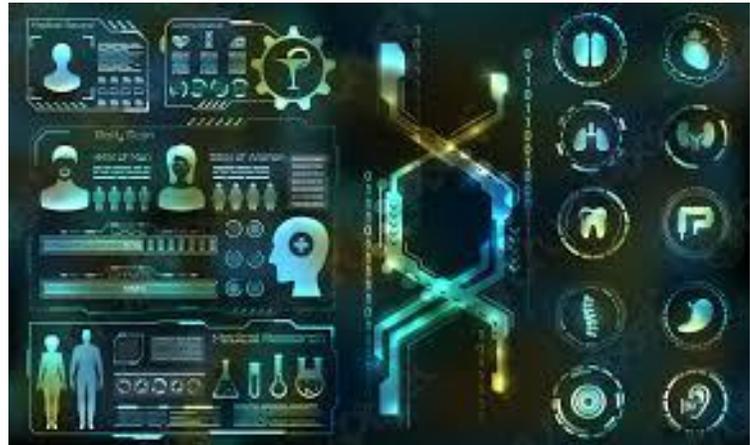
The citizens include all nationalities, religions, and ages. The New York Times reported that Galveston Island is the melting pot of civilization. Residents often work from home or beachside since many jobs allow employees to work remotely due to technological advances.

The beaches are lined with palm trees and artificial tree-like structures that filter carbon dioxide from the air. These structures serve as WiFi connection spots, complete with cameras utilized for security purposes. Technicians monitor these cameras and dispatch needed emergency services based on the issue. Fire and Police services are located within each community, eliminating long response times. Homes and businesses contain sensors to identify emergencies. Other services citizens receive from the city are water, trash, and recycling.

With Galveston's primary concern being the people's well-being, each family possesses an advanced whole-body 3D scanner that fits into a doorway. Citizens use the machine to scan their bodies to monitor their whole body system to make them aware of any possible illness and to prevent chronic diseases. The city also provides a

watch to each community member, which reads their vital signs and temperature. It sends a notification to the hospital. Medical treatment is provided as needed.

After work, families enjoy swimming and water surfing. Virtual arcades are very popular these days; virtual arcades help increase physical exercise. Children create a virtual world that enhances their confidence and helps them release any stress they may be feeling.



Education will allow students to immerse and be active in a simulated reality. Students can build, change and interact in their worlds through virtual reality and holographic technology. Personal information will be safe and secure through international systems. Batteries will charge through the students' kinetic movement.



Classroom design will take on a more modular design where spaces and schedules can shift and change quickly to fit the needs of students. Wall consists of touchscreen panels. Haptic technology allows students to feel textures such as elephant skin or the moon's surface. The simulation will allow students to operate on a heart or fly a plane, just like in real life.

Public transportation consists of solar-powered sky trams, hydroelectric power buses, and self-driving electric taxis. Bicycles and Power Scooters are provided for citizens to travel around the neighborhood. Underwater vacuum tube tunnels connect the floating communities to the main island. While based on Elon Musk's hyperloop modifications, individuals can connect personal transportation pods directly from their homes.

Energy

Located on the coast, Galveston harnesses tidal energy to generate electricity providing more than enough electricity for the entire city. Additionally, the city utilizes offshore solar farms and wind turbines, rounding out its electricity grid.



Problem

Galveston Island faced a significant challenge due to climate change: rising sea levels. Residents paid little attention until they saw how the rising sea level affected their crops, animals, and people's health. The economy, which depended on tourism, dwindled as the beaches disappeared. As the sea level rose, it affected the coastal habitats of the many wildlife living there and the people. Melting glaciers and ice caps due to global warming added to the problem since the previous generation failed to control carbon dioxide emissions.

Solution

Climate change adaptation solutions are implemented by protecting the mangrove forest, which removes carbon dioxide from the atmosphere. Utilizing recycled materials when building homes, including brick made from recycled plastics, walking or cycling instead of driving, and utilizing renewable energy to heat and cool homes. City planners revised the building codes requiring new homes to maintain a minimum distance from shore and require modifications to existing homes where the bottom floor is no longer residential but retrofitted to withstand floodwater. They also reclaimed lowlands by filling in with rock or soil to raise the ground creating adequate green spaces.

Engineers created public spaces to absorb and store water during flooding seasons. In combination with super levees, drainage and pumping systems improvements have a wide flat slope compared to traditional levees. Environmental engineers created natural habitats benefiting the environment while keeping the rising sea level at bay. Housing developers along the coast created subdivisions near super

levees, green parks, vertical farms, and greenhouses that eliminate transporting food long distances, decreasing energy use.

Civil engineers deployed coastal planning techniques to mitigate coastal hazards, including raising buildings, using waterproof materials in old and new construction, and modifying drainage systems, including pumping devices. Floating communities became part of the new urban development. They designed communities to withstand hurricanes and floods. Each section houses 10,000 citizens and produces needed food and energy in a zero-waste system. Ensure citizens followed these plans; officials developed laws and regulations in the contingency plan. Citizens were required to meet city regulations to obtain home insurance.



The cost of developing new flood resistance barriers and buildings raised taxes. However, the increase in population ultimately outweighed any cost disadvantages. Ecological concerns are that the construction of floating communities might cause damage to marine ecosystems. However, studies have shown no long-term damage after fifty years to marine life.

Life on Galveston Island in 2122 provides comfortable living conditions for residents and tourists alike. Reducing carbon production, introducing the carbon filtration system of artificial trees and homes, and eliminating fossil fuel consumption reduced global warming. Floating communities provide safe flood-resistant homes for residents. Tidal energy powers the majority of homes and businesses. If one comes for a vacation, one might decide to move to Galveston Island.

Word count 992

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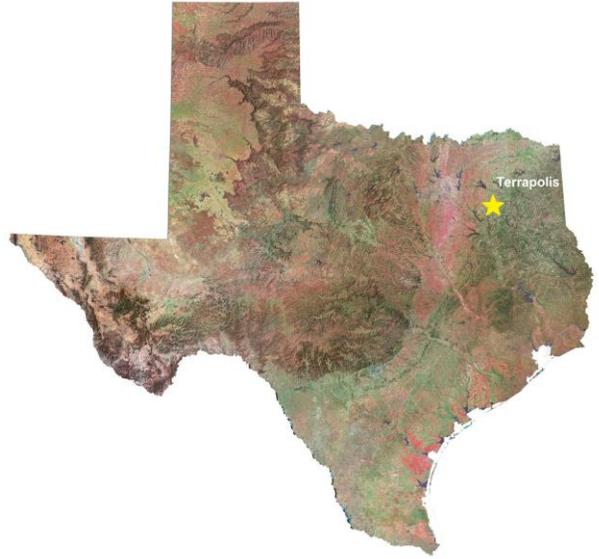
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Terrapolis

The City

Terrapolis, taken from the name terra for Earth and metropolis, is a breathtaking eco-friendly city in the heart of Texas, located approximately an hour east of Dallas. A diverse and highly skilled population who range in age from 20 to 60. The population of Terrapolis now totals 500,000. Drought has changed the landscape in this area, making it semi-arid. Thanks to the efforts of engineers and citizens, the land in and surrounding the city are returning to a more forested area.



City Life

The major employers are the CO2 conversion plant, agricultural activities, electrical plants, electrical car dealerships, tree farmers, and many trade jobs. In their free time, the citizens can enjoy fast-paced activities such as the Kenobi Aquatic Center or the Octo Sports Center, which has eight wings for different sports. Leisure activities provided for the citizens include playing in arcades or visiting one of the many parks throughout the city. The largest park is Kineco Park, named after one of the city founders, Louis Kineco

Houses, and several community buildings in Terrapolis are geodesic domes made from bio-ceramics, carbon rock, and plant-based building supplies. These structures will withstand extreme elements for 500 years and are bugproof, mold-proof, rustproof, and will not rot. The tops of some of the domes will have gardens that will clean the air in the house of carbon dioxide, while others will have solar panels to provide energy for the home.



City Service

The services Terrapolis offers are vast and ensure that the daily community's needs are met. Hospitals monitor health to detect early disease and injuries through microchips inserted in newborns. 24-hour non-emergency hospital care helps people still injured but not in an emergency. Fire stations will have big electrical fire trucks and drones that fly above the fire and help put it out using gray water. Thanks to eco-friendly

batteries, police cars will be fully electric now, and each one will be equipped with one drone. When a crime happens, drones will fly over and get facial recognition of the criminals and stop them. Private transportation consists of self-driving electric cars and bicycles. Public transit consists of electric trains, self-driving taxis, and buses.

Schools in Terrapolis start at 8:00 a.m. Multiple classrooms teach different subjects at their own pace. There is a more relaxed atmosphere to help students not be as stressed and improve mental health. Moving walkways around the school allow all students, even those with disabilities, to get around the school quickly. Interactive AI and holographic technology enable students to get hands-on experiences they would not usually get while still in a controlled environment. Classes will end at 3:00 p.m., leaving free time to participate in other events and help in the community.



With a booming population, a reliable food source is necessary. Agricultural engineers addressed this issue in Terrapolis by developing a vertical farming system. Engineers stacked the vertical farming systems where the crops are grown on top of other structures. Vertical farming takes up less space, uses 95% less water than before, and allows for a more controlled environment. Food scarcity due to lack of rain or excessive heat is no longer an issue for the community.

Climate Change

Due to climate change and CO₂ gasses, Texas' temperatures increased to a more extreme degree, along with the rest of the southern region of North America. The average summer day is around 110°F, and the average winter day is about 65°F. This temperature change also led to longer summers and shorter winters. Heat sickness among humans and animals became prevalent and more severe. The heat has also reduced plant life, both natural vegetation and agriculturally. This rising heat has reduced the production of goods and significantly and negatively impacted Texas' economy. It was necessary to create solutions for these problems.

The Solution

To lower levels of CO₂, scientists and engineers developed the Terradome, a massive dome in the middle of the city. Engineers constructed the dome using carbon nanotubes, an ultra-thin, lightweight material that has the strength of steel but is also eco-friendly. Inside the dome, there is a large nursery where people will help raise trees. When the trees reach an age where their roots are long enough to survive, caretakers

transplant them around the area. While still inside the dome, the trees convert carbon into oxygen. The oxygen is then pushed out all around the city. Less CO₂ in the air and more oxygen have improved not only the environment around Terrapolis but it has also improved the health of its citizens. The only drawback to this system is that it takes a lot of time for the trees to grow enough to survive outside the dome.



An effective way to keep cool is an essential adaptation with the increasing temperatures. Clothing is now made of intelligent fibers that will keep the wearer at the perfect temperature at all times, and they are also weather resistant. The material is made out of thermoelectric alloys that can stretch. The risk of heat-related illnesses has significantly gone down because of the temperature smart clothing. There are even clothing and covering options for animals to

help keep them safe from the heat. The cost of the technology and the risk of malfunction present a problem. Still, computer and software engineers continually work on any issues that arise while also improving the systems already in place.

Conclusion

Terrapolis is a peaceful and quiet place that still has a lot of events. Thanks to the Terradome, there is less CO₂ in the air and more oxygen. The Terradome allows citizens to have a normal lifestyle without worrying about pollution. Smart clothes help the community stay cool in the extreme summers and warm in the winters. Science and technology have made this city an excellent, eco-friendly place that is green and pure.

Word Count 977

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Malmö, Sweden

Have you seen what is happening in the world? Floods, tsunamis, starvation, riots and a crisis in one city! Malmö was destroyed by a horrific flooding event in the year 2022 which resulted in total destruction of the city and the population fell from 350,000 to only 50,000 citizens. Today in 2122, the population has increased to 175,000 thanks to the innovations and increased birth rate. The citizens in Malmö have the average age of 43 and enjoy spending time with families outside activities. The city of Malmö, Sweden which is located in the Scania region $13^{\circ}00'$ east and $55^{\circ}35'$ north, near the southwestern tip of Sweden. The mild climate even with the latitude keeps the chances of snow low and the temperatures remain above freezing with 24.2 inches of rainfall each year. The city is located on the Baltic Sea with water around most of the city and beaches.

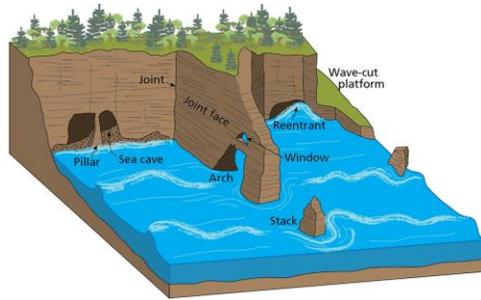


The environmental engineers worked with civil engineers to design a floating city consisting of cables, platforms, and a dome. This technology helped rebuild the city and protect it from the increased water levels. The dome was built in the cooler climate of Malmö, opening glass panes that use the cooler atmosphere to cool the city.

The dome is warmed by the lights and the people inside the

dome. The dome itself protects the city from inclement weather that occurs from tsunamis and storms. The cables are attached to the platforms which form the different sections of the city and prevent the city from being overcome by rising water. These sections are also protected by seawalls that help prevent the waves from damaging buildings and infrastructure. The city is divided into residential, business, educational, and medical sections that are all within a mile of each other. The residents are able to walk or use electric bikes to reach each section within just 30 minutes of each other.

The city uses wave energy to power the floating cities cable that go in and out depending on the water level from rising waters. The waves energy is captured by buoys floating on top of the ocean that is turned into electricity and stored in batteries. The energy comes from the wind that created the wave and the energy is produced by the waves. This ocean based wavegarden creates



an average of 0.6 to 1.2 Wh per wave depending on the size of the wave such as the length and the power of the wave.

Citizens ride electric bikes that are powered by the pedaling of the bike around the town. When they are done riding the bikes, they plug the bikes into their home where the extra energy is loaded into a battery to power appliances in their home. Old roads were replaced with walking and biking paths that are permeable preventing the roads from flooding.

Neighborhoods are designed in local hubs which include where people live, work, shop and go to school. Cisterns on the rooftops store rainwater to water the gardens and green spaces. The multi-family homes are built around green spaces with trees, neighborhood gardens, and rooftop gardens on all of the buildings. The buildings are also equipped with solar panels which power the buildings and the food wastes are converted into biomass fuel. The homes have all been built to be 100% green energy friendly made from recycled materials, wood, and glass walls that let in natural sunlight. Homes are equipped with machines that use food waste to electricity by a process called fluidization which turns food waste into a mixture of gasses. This mixture of gasses is pumped through tubes to places where it is used to industrial buildings to use as fuel.

The children attend schools that are located in local neighborhoods where teachers teach students with holograms. The students choose their course of study based on their personal interests and their academic strengths. Classes are taught in open areas where there is lots of flexible seating and glass walls that open up onto common gardens. The glass walls provide natural light and heat reducing electricity. The students grow their own fruits and vegetables along with chickens for fresh eggs. The school also uses fluidization to provide energy for lighting

The citizens have their health monitored with watches that notify them if they have any signs of disease or illnesses. This has helped reduce disease by preventing it from becoming serious. Doctors treat patients in high tech hospitals where nanobots treat patients with painless treatment plans. These doctors are highly skilled in their field of specialty and they focus on preventing disease which has increased the life expectancy.

The cons of wave energy are effects on the environment, high costs, and scalability. The pros of wave energy include zero emissions, potential energy and reliability. The pros of fluidization is it is renewable, carbon neutral, widely available and can be used in many different ways. The cons of fluidization is that it is not totally clean, inefficient, uses a lot of space, and is expensive. The dome and seawall adaptations

have allowed the city to grow and prosper after being destroyed 100 years ago. People want to live in Malmo because it is environmentally friendly, healthy and is technologically advanced. They also enjoy spending time outside where they can walk everywhere and are excited to continue to improve their city.

Word Count 969

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Nairobi

Have you heard of Nairobi, Kenya? The population fell from 2.7 million citizens to a record low of 500,000 people. It was devastated by drought in 2022 resulting in a great loss of life and it became nearly abandoned. Those who returned to Nairobi created a new city called Bora City which means better in Swahili. Today in 2122, the population has increased to 1.9 million people. With an average age of 40, citizens enjoy community activities and time with families. Citizens come from other cities in Kenya to enjoy its moderate weather. The average temperature is between 54°F to 81°F with short winters and summers. The rainy season is in spring with April having the most rainfall. Nairobi is located in east Africa, south of the equator.



Life in Nairobi, before the drought, was known as the country's lively capital, people visited to climb Mount Kenya and visit the animals at Nairobi National Park. Now, people come to enjoy touring the animal parks, hiking and the beautiful views. Tourism supports the city's economy by providing hospitality jobs through hotels, restaurants and other business activities. Tourism also supports preservation of water resources by reusing water by filtering it in specially designed plants and water is collected in water collection tanks in homes, businesses and schools. Agricultural engineers have covered the city in trees and green belts which has increased the rain along with

The hotels and other buildings throughout the city have been rebuilt to conserve and produce their own energy. Their homes are built from recycled materials made from plastics making them insulated and windows are made with solar glass which produces enough energy to power appliances. The mechanical engineers designed windows that are equipped with solar panels which produce electricity from the light that can't be seen by humans turning it into energy to power electronics. Mechanical engineers and inventors designed paving tiles that turn mechanical energy into electrical energy when citizens walk on them. This clean source of energy is low carbon and it helps preserve natural land and its animals. The civil engineers replaced the cement sidewalks with technology that converts the energy from people walking into electricity that is able to power buildings throughout the city.



These tiles also record data and give citizens rewards for walking in the city. Power is created when the foot pushes the triangular boards down to a specific depth. The tiles are made in a triangular design that makes it strong, creates large amounts of energy and is installed all through the city. The energy created is enough to power a light bulb for an average of 5 seconds and is stored to power small appliances in homes.

The city is equipped with modern technology for the first responders such as radio controlled drones that spray fires with fire retardant materials which conserves water. Cameras are placed throughout the buildings to monitor things like fires, robberies or medical emergencies. Buildings have been rebuilt with recycled materials including solar panel glass windows, bricks made from plastics and built to take advantage of the natural sunlight instead of using electricity.

The citizens in Nairobi use electromagnetic trains for their mass source of mass transportation. They use two of the north or south magnets that push against the other so the train floats over the track. The lack of friction allows these trains to run at high speeds with little pollution. Maglev is an abbreviation for magnetic levitation. The trains are equipped with robots who serve passengers with healthy snacks and they also drive the trains. The train cars are equipped with solar panels to power the inside lights and other

parts of the train. For short distances, the citizens walk and ride electric bikes throughout the city. The city is designed for people to live close to their homes, work, schools and businesses.

All children have a free education which is different from when families in Kenya had to pay for school before. The schools are close to homes so that kids spend more time learning than transporting to and from school. Giving children an education with holographic instructors allows children to learn at their own pace and pursue their dreams. Students pursue careers that will benefit Nairobi with new scientists and engineers who will continue



to expand new technologies. Upper school students have the chance to research solutions to eliminate poverty and disease. They have discovered how to grow organs in a lab so that patients suffer less from pain and have decreased the death rate from lack of transplants.

The pros and cons of paving tiles is that they are limited to certain areas of the city and may malfunction when there is flooding but they do produce energy without having people go out of their way. Solar panel windows may be damaged from hail but are now reinforced by engineers which has decreased the loss of windows. The electromagnetic trains travel at high speeds which can result in trains coming off their path and causing injury to passengers. Electric bikes work well with short distances but are not great for traveling long distances.

Word Count 930

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