



SEALOEarth
Serene Environment And Life On Earth

A world in which all people participate in the stewardship of planet Earth.

SEALOEarth in Special Consultative Status with the United Nations ECOSOC since 2017

NEWSLETTER

Earth Day 2021

"The greatest threat to our planet is the belief that someone else will save it."

~ Robert Swan

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Humming birds and Yellow Throated Toucan.
Photos credit: Praveen Siddannavar

We hope that you will enjoy reading this newsletter!

Extinction Alert

White-bellied pangolin (*Phataginus tricuspis*)

Africa



Pangolin with her baby. Photo credit: Joel Sartore, National Geographic

Pangolin

White-bellied pangolins are found in West Africa and Central Africa and as far south as northwestern Zambia and Angola (National Geographic). They are found in 22 countries in this region. Of the four pangolin species found in Asia, two are listed as endangered and two as critically endangered by the International Union for Conservation of Nature (IUCN), in part due to overhunting.

Pangolins are mammals with a number of interesting adaptations. They have sharp, overlapping scales which accounts for about 20 percent of its weight, and they protect themselves by curling up into a scale-covered ball. They have a long, prehensile tail and clawed feet to help them move in the high branches of trees. Pangolins can extend their long tongue up to 25 centimeters (about 10 inches), making it easier for them to access the ants and termites, which make up the bulk of their diet. It has no external ears, but its hearing is quite good. It also has no teeth and instead possesses a gizzard-like stomach that is specially adapted for grinding food (African Wildlife Foundation).

According to World Wildlife Fund (WWF), more than 1 million pangolins were trafficked over a ten-year period.

Historically pangolins were poached primarily for bushmeat, with their scales cast aside as byproducts. Over the last decade, however, the price fetched for skins, scales and the whole animal in countries like Vietnam and China, as well as in the US, has resulted in decimated populations.



Pangolin skins are processed into leather products like boots, belts, and bags. Photo credit: Keith Arnold, WWF-US

With an increase in connectivity and ease of sharing content around the world, the trafficking of these animals has been exacerbated by an unlikely culprit; the Internet. And they aren't alone. The world's most endangered species, from elephants, to rhinos and tigers, can all be found with a scroll or a swipe across everyday apps. WWF is bringing together the largest online companies to fight illegal online trade of wildlife. They work together to strengthen and harmonize wildlife policies, train enforcement staff to better detect endangered species and their products, educate billions of users about wildlife trafficking and how to report illegal products, enhance automated detection systems such as image recognition, and share learning across the industry.

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Celebration of Earth

Westford, Massachusetts, USA

On April 22nd, 2021, the Earth Flag was hoisted at the home of Dr. Chaitanya Hiremath.

Virtual Earth Day Celebration from Westford, Massachusetts was arranged on Saturday, April 24th 2021 using Zoom and was hosted by Dr. Hiremath. The participants shared ecological addresses for public places such as San Diego Zoo, Eiffel Tower, Disneyworld, and Parliament Hill. Mrs. Shobha Hiremath facilitated the proceedings of the event. Arjun Saraff from Ontario, Canada played a musical piece on piano, Jurassic Park Main Theme, composed and orchestrated by John Williams. The invited contestants read their essays aloud. Mrs. Rebecca Ingerslev and Mrs. Catherine Pastore spoke and announced the awards. The certificates and prizes were mailed.

Global Essay Contest 2021



Around the World

In the early 2021 alone, SEALOEarth's global reach included countries such as, Cambodia, China, Malaysia, Germany, Hong Kong, India, Indonesia, Italy, Jamaica, Krygystan, Mauritius, Nepal, Nigeria, Pakistan, Philippines, Republic of Korea, Romania, Russia, Saudi Arabia, Singapore,

Srilanka, Thailand, Ukraine, United Kingdom, and United States among others.

This year's entries seemed to be especially creative in the various focuses of their essays and the range of ideas. After prescreening, the essays were blind-scored by our international panel of judges from Australia and the United States. Teachers from several schools motivated their students to participate in the contest.

Awards

"How do we create a future in which both people and nature can thrive?"

Youth (ages 9-14)

Mahiro Jilesen, 12 (MA, USA)	First place
Aashrith Ram, 12 (MA, USA)	Second place

Juniors (ages 15-18)

Alette Bernier, 16 (MA, USA)	First place
Elissa Adamson, 18 (NY, USA)	Second place

Honorable Mention

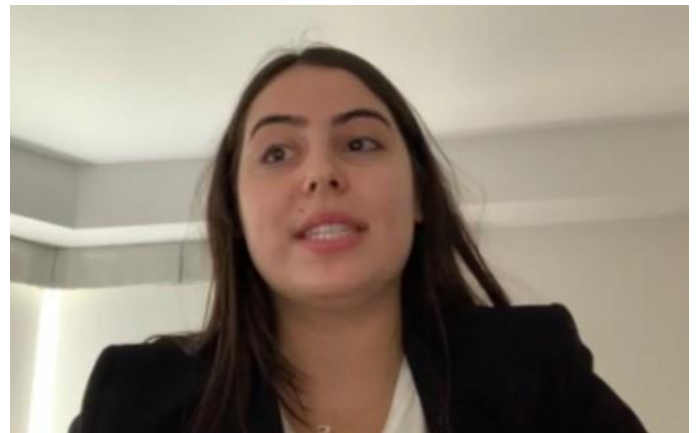
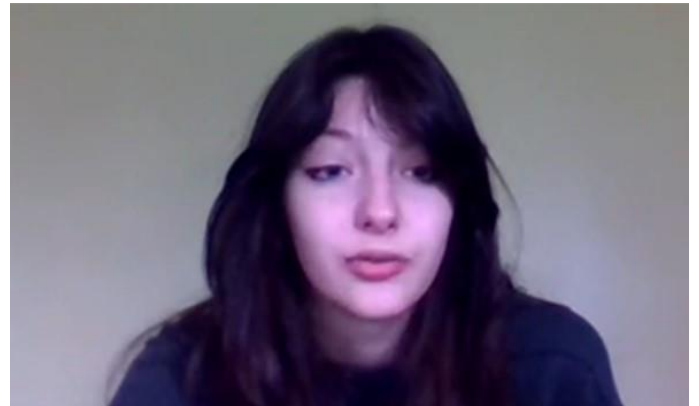
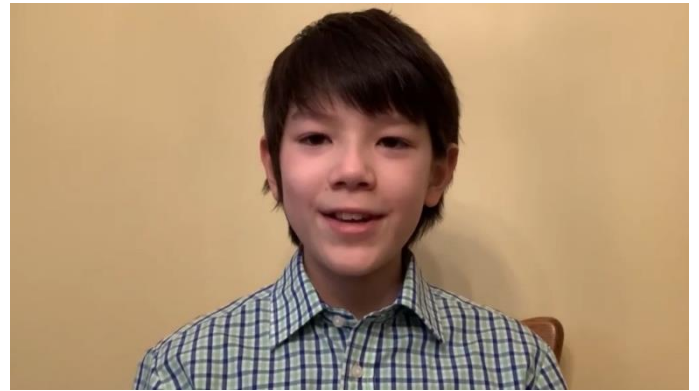
Alyssa Guglielmo, 17 (MA, USA)
Claire Tang, 13 (NJ, USA)
Grace Smith, 16 (MA, USA)
Kaitlyn Choong, 12 (CA, USA)
Vineeth Godavarti, 11 (MA, USA)

Essay prompt for 2022

"How can local communities benefit from their location while positively contributing to conservation outcomes?"

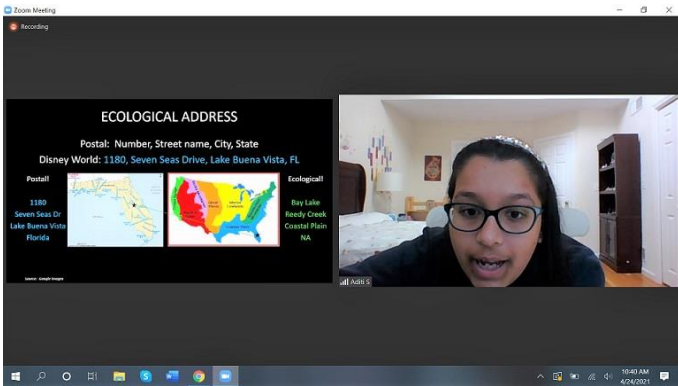
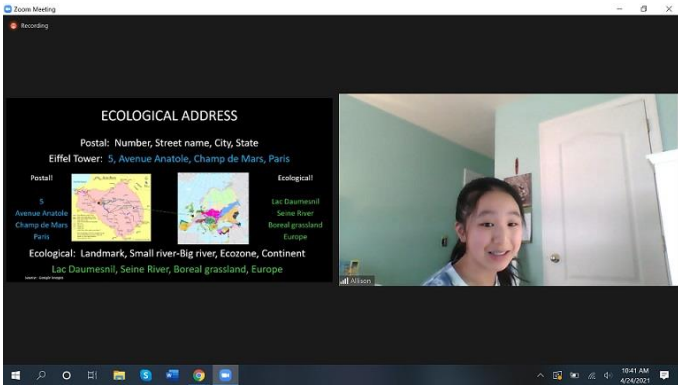
The deadline is March 1, 2022.

For more information, please visit:
<http://sealoeearth.org/essaycontest.html>





Photos credit: Videos sent by the contestants.



Screen shoots. Photos credit: Sadhika Hiremath



Mahiro J. Photo credit: Jonathan Jilesen



Aashrith R. Photo credit: Thripura

Equality. Intraspecies. Interspecies. **Home.**

“Harmony within species is just as important as harmony between species because we are all made up of the same basic building blocks of life.”

- DR. HIREMATH



Nature in your Neighborhood



Black White Owl. Photo credit: Praveen Siddannavar

Republic of Costa Rica, Central America

Costa Rica – The Natural World!



Praveen Siddannavar, India

**Award winning
Natural history photographer
Wildlife conservationist**

Costa Rica is a rugged, rain forested Central American country with coastlines on the Caribbean and Pacific. Though its capital, San Jose, is home to cultural institutions like the Pre-Columbian Gold Museum, Costa Rica is known for its beaches, volcanoes, and amazing biodiversity (M. Cathorall). The country is considered to possess the highest density of biodiversity of any country worldwide. While encompassing just one third of a percent of Earth's

landmass, approximately the size of West Virginia, Costa Rica contains four percent of species estimated to exist on the planet.

Costa Rica is rich in wide variety of wildlife that include beautiful birds, amphibians & reptiles, mammals and some exceptional species are spider monkeys and quetzal birds.



Resplendent Quetzal. Photo credit: Praveen Siddannavar

Resplendent Quetzal: If you ever visit Costa Rica on a birding trip, and have returned without having spotted “Resplendent Quetzal” it is considered to be an incomplete trip. Resplendent Quetzals belong to the trogon family and are tropical forest birds that are found in Central America. They mainly feed on fruits – avocado is their most favorite fruit, they also feed on insects, lizards and other small creatures. The males Quetzals have almost one-meter-long twin tail known as trains, females do not possess such long tail. Quetzals are listed as “Threatened” species mainly due to loss of habitat (IUCN Red List).



Mexican Long Tongued Bat. Photo credit: Praveen Siddannavar

Mexican Long Tongued Bat: These bats are found in central, south and parts of north America. Unfortunately, these bats are classified as “Threatened” species (IUCN Red List), due to ongoing habitat loss, which includes loss of roosting sites in caves due to mining and tourism. These bats mainly feed on nectar and fruits from other plants. Its tongue can extend up to a third of its body length, enabling it to reach nectar deep inside a blossom.



Scarlet Macaw. Photo credit: Praveen Siddannavar

Scarlet Macaw: This macaw is considered to be the most beautiful and colorful in the parrot family and interestingly is native to Costa Rica, hence there can't be a better place to find these macaws. They have vibrant red, yellow and blue colors and have been found in central and south America. They mainly feed on nuts, leaves and berries from the rainforest. The life spans of these macaws in the wild are up to 50 years and in captivity they almost out beat humans and live up to 80 years. The major threat for these macaws is loss of habitat in the rainforests and pet trade.



Keel Billed Toucan. Photo credit: Praveen Siddannavar

Keel Billed Toucan: This is by far the most beautiful bird that I captured in the Costa Rican rainforests. This bird is also

known as the Rainbow-Billed Toucan, considered as the most colorful bird in Latin America and is a member of Toucan family. The species is found in tropical jungles from southern Mexico to Colombia. It is an omnivorous forest bird that feeds on fruits, seeds, insects, invertebrates, lizards, snakes, and small birds and their eggs. This bird is the National bird of Belize that is Caribbean country located on the northeastern coast of Central America.



Yellow Throated Toucan. Photo credit: Praveen Siddannavar

Yellow Throated Toucan: This is yet another amazingly beautiful and colorful toucan. Found in the lowlands of Costa Rica and other parts of central and South America. One of the most attractive features of this toucan is its massive bicolored bill. Like other toucan these are frugivorous and occasionally feed on insects, rodents, lizards and eggs of other birds.



Green Honeycreeper. Photo credit: Praveen Siddannavar

Green Honeycreeper: These are brightly colored tanagers found from southern Mexico to Brazil. This species occurs in the canopy of humid lowland forest & I was fortunate to have

these birds in and around the lodge so frequently. They can be found singly or in pairs and often forage as part of mixed species flocks. Green Honeycreepers consume mostly fruit although they also consume small insects and nectar. It was interesting to see that this bird feeding on the white flower buds from this lovely & colorful perch.



The Brown-hooded Parrots. Photo credit: Praveen Siddannavar

The Brown-hooded Parrots: These are amazing and colorful birds found mainly in central and South America. The present species is distributed primarily over the Caribbean slope of Middle America, from eastern Mexico south to Panama, and extreme northern Colombia. This parrot is primarily green with dark wingtips, some red feathering on the flanks and underwing, with a largely brown head, relieved by a pale patch of bare skin around the eyes, and a line of red feathers.



Red Eyed Tree Frog. Photo credit: Praveen Siddannavar

Red Eyed Tree Frog: These frogs are considered most charming amphibians simply because of their bright red eyes, colorful sides and an extremely expressive face. No wonder it's hard not to be fascinated by this wonderful frog.

These frogs are arboreal, meaning they spend a lot of time hiding on trees. They live in tropical lowlands in Central America and Northern Southern America. Despite of their bright colors these frogs have excellent way to camouflage especially while they are on trees sitting on leaves. They simply tuck their legs in close to its body and close their eyes; the green membrane from the eye comes into play that helps camouflage.



The Green Violet ears hummingbird. Photo credit: Praveen Siddannavar

The Green Violet ears hummingbird: These are also known as Mexican violet ears and primarily found in highlands, cloud forest of Costa Rica, Mexico and western panama. They feed on nectar taken from a variety of brightly colored, scented small flowers of trees, herbs and shrubs. They favor flowers with the highest sugar content (often red-colored and tubular-shaped) and aggressively protect, those areas containing flowers with high energy nectar as seen in the image. They use their long, extendible, straw-like tongues to retrieve the nectar while hovering with their tails cocked upward as they are

licking at the nectar up to 13 times per second. Sometimes they may be seen hanging on the flower while feeding.



Honduran White Bats. Photo credit: Praveen Siddannavar

Honduran White Bats: These bats are also called the Caribbean white tent-making bat and are a species of bat in the family *Phyllostomatidae*. These bats construct tents using leaves and by cutting the ribs/veins of the leaves using their sharp teeth. This ensures that the leaves fold downwards forming like a tent. Both males and females work together to build the tents. These bats have distinctive, entirely white fur, which is only found in 6 species of bats roughly from the 1300 bats species that have been recorded. These bats roost in these tents during the day and are frugivore, mostly consuming fruits of fig. Due to habitat loss, these bats have listed as “Near

Threatened” (IUCN Red List). These bats are found mainly in Honduras, Costa Rica & Western Panama.



Strawberry Poison Dart Frogs. Photo credit: Praveen Siddannavar

Strawberry Poison Dart Frogs: These frogs are known for their striking beautiful skin colors and one can easily get carried away to touch them. Their bright color serves as a warning to predators, that they are toxic. This type of warning coloration is called “Aposematism”. These frogs are very tiny and found in Costa Rica’s humid lowland rainforest and plantations. Strawberry dart poison frogs are diurnal, as they don’t possess threat from predators, only exception is the amazon ground snakes that feed on these frogs. Did you know? The Native Americans used the toxic secretions on these frogs, to poison their blow darts. The name dart frog is derived from this practice of the Native Americans.

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Praveen Siddannavar’s images have also been exhibited both at national and international art galleries in London, New York, Portugal, Iraq, Dubai & India.

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<https://www.facebook.com/PraveenSiddannavarPhotography?ref=hl>

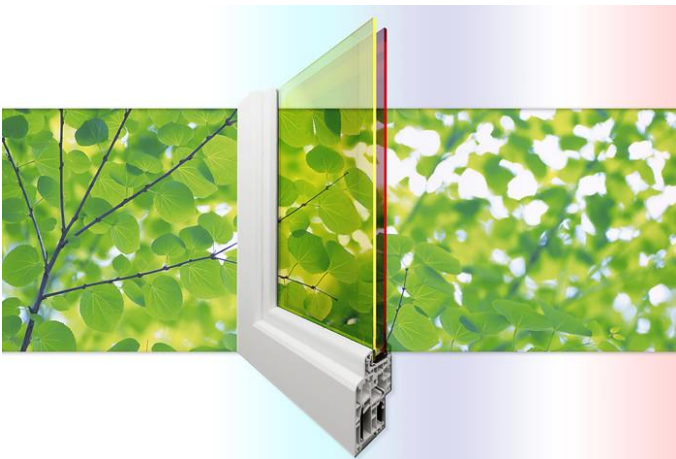
<https://www.instagram.com/praveensiddannavar/?hl=en>

Achieving and Maintaining the Anthropocene



Mahiro Jilesen (12)
Massachusetts, USA

In the future for humans and nature to live side by side there must be a stable balance between them, but to find this balance there are many steps. In the video called *How to save our planet* by WWF International they say, “For the biggest gains we could concentrate our efforts on four main goals.”



Transparent Solar Panels. Photo credit: Los Alamos National Laboratory

The first goal mentioned in the video, which is also currently our biggest problem, is our energy. The electricity we use is mainly generated from fossil fuels that sadly create a lot of waste. Every day toxic gasses which are responsible for

deaths of animals and humans alike are pumped into the air we breathe, but there are lots of solutions being invented even today. There are many better ways of producing electricity than fossil fuels, some are even more efficient. In the video *Top 10 Energy Sources of the Future* they said that, “researchers of the Los Alamos National laboratory in New Mexico just made a significant breakthrough in quantum dot solar cell technology that will allow highly efficient solar panels to double as transparent windows.” Now every window could be a power station which does not pollute our atmosphere. Energy is one of the most essential things in the universe. It is our transportation, our communication and our entertainment. Being able to generate it cleanly would change the world, so we should invest in research and adoption of clean energy.



High-tech Greenhouses. Photo credit: U Gaat Bouwen

Our second goal and its problems are not as infamous as the energy problem but it is just as desperate. We need to make a lot more food. Farms take up miles of the earth's land area and resources, yet are not producing enough food. The main reasons are that most of our farms are not efficient enough and are open air and uncontrollable. In the video called *The Futuristic Farms That Will Feed the World* by freethink they say, “Just had a cup of coffee. Do you know how many liters of water were needed to produce that coffee? Rough guess 150.” There is an unacceptable difference between the amount of clean water used to the value of that one cup of coffee. Even worse, some of the crops the water is used on die due to pests. This is why the Netherlands have developed high

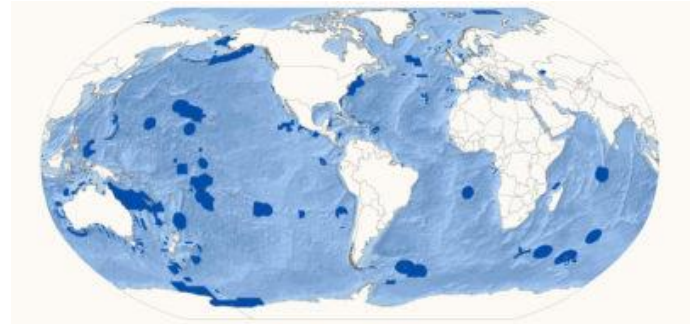
tech greenhouses so the farmers use less effort, less resources and less waste while still successfully producing crops. These green houses are self-sustaining and can control their own climate and kill their own pests with drones so it wastes less of the earth's precious resources. My own idea is that the drones could charge on bio fuels extracted from the farm, this would make them even more energy efficient. To solve this problem, we need to make more efficient farms and greenhouses.



Gray Wolf. Photo credit: National Park Service, MacNeil Lyons

The third goal is to keep the wildlife we still have left. In the video called *Top 10 Animals That are good for the environment* it is said that "All Animals have an important role in the ecosystem. Some animals help to bring out the nutrients in the cycle while others help in decomposition, carbon and nitrogen cycles." Each animal is needed for the earth to survive and if we accidentally remove one vital species in an ecosystem, we may destroy it completely. An example of this is Yellowstone National Park. In 1926 farmers who wanted to keep their livestock safe killed the last of the wolves in Yellowstone. After the apex predator of the ecosystem were removed coyotes, deer and elk thrived. In the book called *The Yellowstone Wolf - A Guide and Sourcebook* by Schullery Paul, Paul states "Without wolves, coyote populations increased dramatically which adversely impacted the pronghorn antelope population". The elk also damaged the ecosystem by overgrazing native grasses and berries. This caused many landslides because there were no plant roots to keep the dirt and rock in place. Thankfully we were able to reintroduce the same species of wolf back into Yellowstone in

time. We must work hard so nothing like this can happen again by adding nature wherever we can like in backyards or in parks and keeping animals safe.



Marine Protected Areas (dark blue). Photo credit: UNEP-WCMC / IUCN

Last but not least our fourth goal is to manage our oceans. All of us have seen the mess we have made of our beautiful blue reservoirs of life. Plastic bags floating across the surface of the sea, the big trash patch of the pacific, turtles getting tangled in bits of trash. This is one problem that cannot be ignored. In the video by national geographic called *These are the Ocean's Protected Areas - and We Need More* they said "Marine protected areas cover only 3% of the world's oceans." We are using the ocean as a place to throw our waste into. It is like using a priceless piece of pottery as a trash can. We need to make more marine protected areas and manage water runoff. Our oceans are made of liquid water and that is unique to our planet. No other celestial body in the whole solar system has liquid water oceans. This is not a voluntary choice to save our oceans, this is mandatory for the whole world's survival, this is mandatory for a better future.

There is so much we can do to help nature and to live alongside it instead of conquering and destroying it. I have only listed a few solutions. For the good of all things on earth we must work hard to protect the environment.

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Create a Marine Protected Area: Example

Resource Library National Geographic

Students brainstorm and analyze competing ocean resources and uses. They experiment with designating a marine protected area along an imaginary coastline and discuss the challenges of deciding on rules and restrictions within it.



A tiger shark in Papahānaumokuākea Marine National Monument, a 583,000-square-mile U.S. Marine Protected Area near Hawaii. Photo credit: NOAA



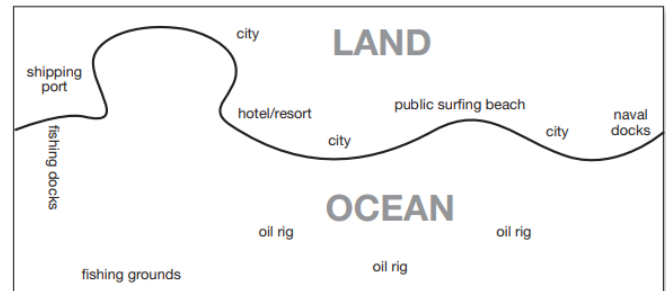
Mariana Trench Marine Park. An aerial view of Saipan Island in Micronesia. Photo credit: Paul Chesley



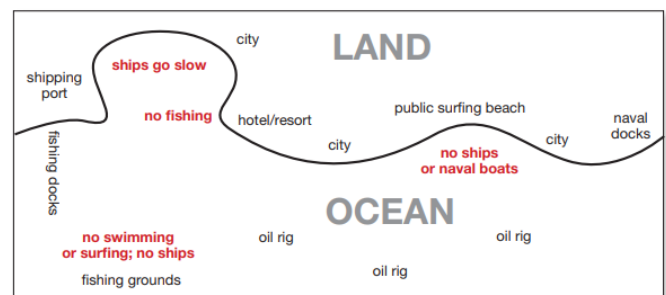
Aguadilla Coastline. Located in northwest Puerto Rico, this city is best known for its beaches. Photo credit: Melyorise Sepulveda, Myshot

Our Marine Protected Area: Example

Part 1. Create an imaginary, multi-use coastline like the example below. Include people, cities, industries, and other ocean users and uses to make your class drawing more detailed.



Part 2. Designate a Marine Protected Area along the coastline. Create rules and restrictions that protect ocean users and resources. Write these rules and restrictions in a different color on your drawing of the imaginary coastline.



NATIONAL GEOGRAPHIC
education
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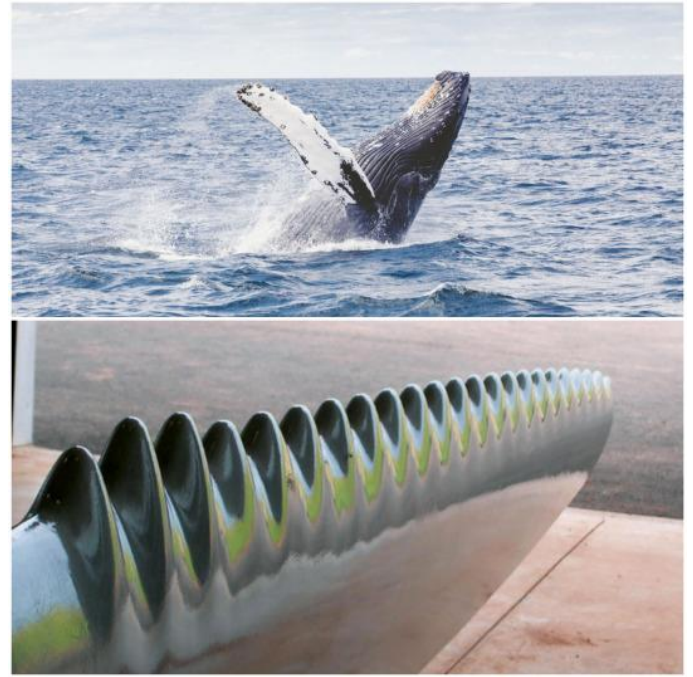
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Becoming Apprentices to Animals



Claire Tang (13)
New Jersey, USA

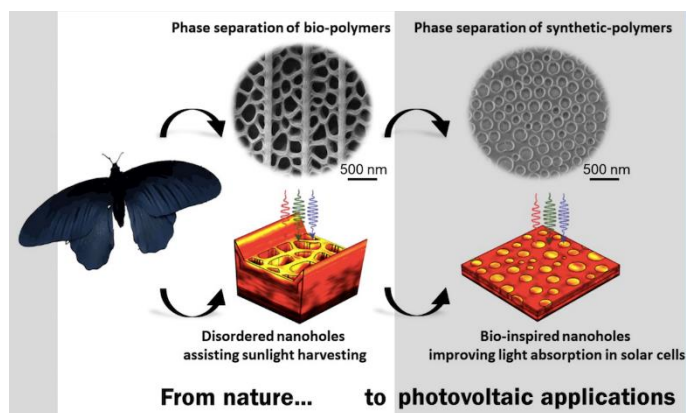
For 3.8 billion years, life has been on Earth, living in a constant state of balance with its surroundings, learning how to solve problems and thrive with resources from nature. Humans are also continually coming up with ideas to better thrive on Earth. But the difference between us and these organisms is that we solve our problems at the expense of nature, leading to climate change and deforestation. We treat Earth as an afterthought. We prioritize ourselves over our home. As brought up by Sir David Attenborough of WWF International, “we now determine nature’s survival, the planet is ours” (“How to Save Our Planet” 1:49-1:54). So how do we create a sustainable world? The answers lie within our surroundings, in our biological elders, organisms and animals who have proceeded us for billions of years. Some of mankind’s most magnificent inventions were inspired by nature, and most of the problems and conflicts we face as humans have already been solved sustainably by animals. We need to study animal models, emulate their forms, processes, and strategies to design sustainable ways to solve human struggles. This is biomimicry, innovation, and problem-solving inspired by nature, the key to creating a future where both people and nature thrive.



Whale-inspired Wind Turbines. Photo credit: WhalePower

Biomimicry can help solve one of mankind’s biggest conflicts with nature, the consistent and overwhelmingly immense reliance on ancient photosynthesis trapped in fossil fuels. If we continue to rely on fossil fuels for energy, greenhouse gas emissions will skyrocket, polluting the air and eventually killing nature as well as ourselves. But how do we harvest enough renewable energy to power our demands while not harming nature? Some scientists and engineers are turning to animals for answers. Researchers at West Chester University have studied how emulation of Humpback whale fins on windmills could reduce its turbulence, therefore increasing its energy-generating efficiency. Humpback whales have tail flippers with scalloped edges called tubercles, responsible for reducing turbulence. When mimicking these tubercles on multiple windmills and turbines, they found that the turbines with tubercles were 35% more efficient at collecting renewable energy than conventional ones (Broun). The application of this biomimetic idea results in windmills more effective at collecting energy. Another sustainable alternative to harmful fossil fuels is the use of solar energy gathered through solar panels. Nature has many creatures who are insanely effective at collecting solar energy. One of which is the Rose Butterfly. Because this butterfly relies heavily on sunlight, its thin black wings have evolved to absorb a lot of light (Chen). Radwanul

Siddique, a scientist striving to build better solar panels, observed that these butterflies possess wings built from tiny scales covered in randomly spaced holes. These holes, being less than a millionth of a meter wide help scatter the light and allow the butterfly to absorb and store massive amounts of solar energy. After emulating the butterfly wing structure on test-size solar panels, Siddique observed that these panels could harvest lights twice more efficiently throughout the day than conventional ones (Chen). Not only are these nature-inspired, biomimetic inventions less expensive to produce, they are also proven to be greatly more effective in harnessing renewable energy than conventional ones, leading to clean air all of us can breathe.



Butterfly-inspired Solar Panels. Photo credit: Radwanul Hasan Siddique, KIT/Caltech

With biomimicry, we can cultivate ways to farm and produce food more sustainably in the future, helping both nature and humans thrive. With the growing population, there will be a correlated growth of food production demands. As stated by Ernst van den Ende, “If you want to feed the world in 2050, then the next forty years, we need to produce the same amount of food as we did over the last eight-thousand years” (“Fantastic Farms” 0:01-0:12). To accomplish this massive goal of food, we will need another agricultural revolution. The first agricultural revolution was characterized by exploitation and expansion, feeding humans at the expense of nature (Loken). But that is not an option for the second agricultural revolution. A stable climate with predictable weather patterns and seasons is essential for agriculture. This means that we cannot keep expanding our farmlands while using an excessive amount of greenhouse gases and water, because not only

would that harm nature, it would also make it impossible for successful agriculture, causing humans to starve (Loken). The second revolution will need to increase the output of crops on our already existing farmland while using fewer resources, especially water. Scientists have turned to nature for the answers of getting abundant crops sustainably. A few years ago, a scientist named Rusty Rodriguez traveled to Yellowstone park in hopes of observing and learning from nature. When he stumbled across a hot spring, he noticed there was an enormous amount of densely-packed grass growing around them. This grass, “Panic Grass”, usually didn’t survive in these harsh conditions, so Rodriguez dug them up for further examination. Upon further examination, Rodriguez found that there was a fungal helper wrapped around the grass, allowing the plant to grow with little resources and land. He was able to inoculate the fungus into some rice seeds. Rodriguez observed that these altered-seeds grew five times more rice than usual with half the water (Benyus). With the emulation of these biomimetic fungal helpers on seeds, we can grow more crops with less water, leading to sustainable farming with fewer resources and deforestation.



Dichanthelium lanuginosum hydrothermal-tolerant grass. Photo credit: James St. John

The reduction of chemicals in the material we produce is vital to helping both people and nature thrive. Hazardous chemicals from our factories often move through the air, soil, and water, exposing people to toxic air while polluting the environment. Our synthetic chemistry is vastly different than nature’s chemistry. We use every element in the

periodic table, even toxic ones, then use brute force reactions to get elements to bond and break apart (Benyus). Organisms make materials in and around their body, so they cannot afford to use hazardous toxins and high temperatures, yet the materials that come from nature are the most strong, durable, colorful, and of course sustainable. Take abalone shells for example. These mothers of pearls make shells two times stronger than ceramics, and six times stronger than steel (Benyus). They make them by releasing a protein into the seawater that creates a template. On the template, there are charged landing sites. The calcium and carbonate in the seawater are also charged, so they end up on particular sites of the template, directing the crystallization and self-assembly of this material. Perhaps, in the distant future, we can replace harmful, chemical-abundant steel production with this natural process. Life also often replaces chemicals with shapes, take natural colors for example. The most brilliantly colored creatures have no pigments in them, instead, the color we see is produced by shapes and structure. Surprisingly, the richly colored peacock has no pigments in its feathers except for brown (Benyus). It creates a diverse range of colors with layers on the feathers that are a certain distance apart. So as light lands on them, the light becomes bent, reflected, and amplified, making it look blue to our eyes, all without chemistry. Structural colors are four times brighter than synthetic ones and they never fade. These structural colors can become a substitute for our synthetic dyes that are terribly bad for nature, as well as ourselves. The implementation of these biomimetic ideas can create a future where both people and nature thrive.

The answers to creating a sustainable world are all around us. We merely need to look for them. Humans are a relatively young, naive species that have experienced many trials and errors. Our best stance is to become apprentices to nature's geniuses, animals. All of us can learn. Simply go outside and observe the ways of the animals. From the powerful, magnificent wolf, to the little, bumbling bee. Every organism holds an insightful lesson. From these lessons, we will gain inspiration on how to create a sustainably functioning world. Maybe we will figure out how to live off of only sunlight, or how to reduce the acidification of the ocean. We are surrounded by geniuses, millions of species willing to gift their best ideas to us.

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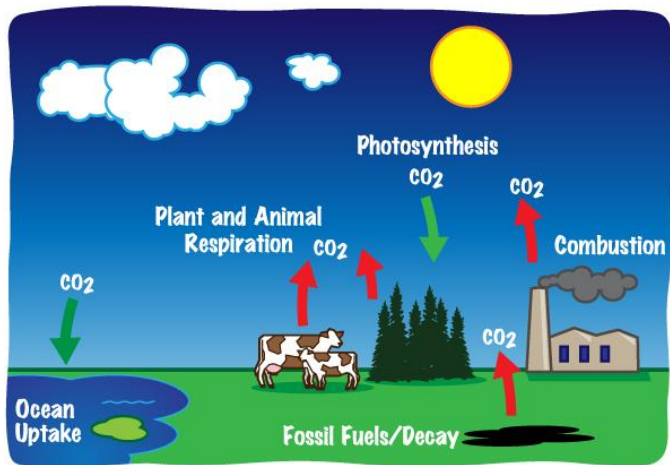
Abalone shells. Photo credit: Wikimedia

Striving for the Future



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People, animals, and plants are all part of the earth, because of global warming we are out of balance with nature. The lives of future generations will be based on what actions we take right now. We can thrive with nature if we fix global warming. With the right ideas and actions taken to fix the issue, we could thrive with nature, perfectly balanced.



Greenhouse gases. Photo credit: Climate Kids / NASA

One of the primary parts of global warming is greenhouse gasses. Now, you may be wondering what causes greenhouse gasses? Greenhouse gasses are mainly caused by factories. When the sun projects heat towards the earth, it goes into the atmosphere and bounces back, trapping the heat. Over time it will get warmer and warmer, therefore glaciers will melt. (Climate Kids) When glaciers start melting, the sea level begins to rise causing more erosion and more frequent storms

such as hurricanes or tsunamis. As the ice melts, animals such as walrus lose their homes. With the ice melting, polar bears have also begun spending more time on land instead of out on the ice. Today 20% of the ocean is made from melted ice. (WWF)

According to Sir David Attenborough, the population of wild animals has been reduced by at least 60%. We need to be more in balance with nature in order for humans to continue living on earth. That's why we need to replace fossil fuels with renewables, upgrade to a more efficient food production system, and work harder to keep the animal population we have. Replacing fossil fuels with renewables will provide us with clean air while keeping hold of the animal population will make us more balanced with nature so we can thrive together. (Attenborough, "How to Save Our Planet")



Glacier in Antarctica. Photo credit: Wim van Passel / WWF

It is important to do your part in helping the earth, it doesn't have to be big as long as you're doing something. As of 2021, there are 7.8 billion people in the world. Imagine everyone doing something to help, that would make a world of difference. Some simple ways to get started are using less electricity, even turning off the water when brushing your teeth will do. Global warming is just one of the many problems that we are facing including pollution. Sea animals have been dying from the plastic they're eating from the ocean. Without plastic in the ocean, sea animals can thrive and reproduce so that we have a thriving ocean ecosystem. Plastic shouldn't even be in

the ocean in the first place, so do your part and keep the plastic out! One of the most common things in the ocean are straws. Straws are small and often are either blown away with the wind or fall out of a garbage bin. To make sure this doesn't happen, using your own reusable straw when going out will reduce the number of straws in the ocean.

Every day, more people try to help our earth. Although the small changes will help, bigger things still need to happen. Elon Musk, the CEO of SpaceX is currently hosting a competition called Carbon Capture. The goal of this contest is to inspire young minds to make ideas to remove carbon dioxide from the atmosphere. This would benefit both us and nature by reducing the heat in the atmosphere which would then slow down the effects of global warming. With a huge prize of 100 million dollars, hopefully, more people will be inspired to think up a solution. (Space.com)



Carbon neutral. Photo credit: Sarah Lawrence for Vox

Those who are really concerned about how much carbon they are contributing to the atmosphere can actually track it by using a carbon footprint calculator. A carbon footprint calculator is a way to see how much carbon you contribute to global warming. With questions such as how much gas you use and how much meat you eat, this method of calculating your carbon footprint is pretty accurate. (The Nature Conservancy) Amazon's CEO pledged to make the company carbon neutral by 2040. Carbon neutral means that the company is removing the same amount of carbon they are releasing. (Vox) Some ways you could reduce your carbon

footprint daily are taking public transport instead of driving, carpooling with friends or family, and practicing the three Rs: Reduce, Reuse and Recycle.

We need to create a sustainable solution so future generations can continue to thrive. (The Nature Conservancy) With some rules made when building new structures such as all buildings are required to have solar panels, the air would be much cleaner. The solar panels will power the house using energy from the sun, which would greatly help the environment if each structure had some. Solar panels are a good source of clean, renewable energy. With everyone using clean energy the air wouldn't be as polluted and the air won't harm water quality or the air people and animals breathe in.

Can people and nature thrive together? The answer is YES, but to get there we must work our hardest and make drastic changes in the years to come. If we can accomplish this, the earth will become a much better place for all species.

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Creating a Future for Humans and Nature to Thrive



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Humans have done some amazing things advancing science and technology through innovation. Scientists like Thomas Edison invented the light bulb and Albert Einstein discovered that nuclear reactions could be used for generating electricity. Inventors like Karl Benz invented the automobile and the Wright brothers built and flew the first airplane. While these scientific inventions and discoveries have improved our lives, they have come at a huge cost. A higher consumption of coal and gasoline to generate power and a rise in automobile and plane travel have resulted in increased pollution of the atmosphere and global warming (“Responding to Climate Change”). Deforestation, which occurs during urbanization, is destroying a vast population of plant species and animals that live on trees; in fact, humans have cut over three trillion trees (“How to Save Our Planet”). In addition to habitat loss, hunting is another reason why many animals are endangered. The rapid pace of human technology advancements has had a huge negative impact on nature by depleting Earth’s natural resources and endangering many species of wildlife. Therefore, we need to create a future in which the balance between humans and nature on earth is even. To create a better future where humans and nature thrive together, we need to control climate change and global warming, end deforestation, and protect endangered animal species. In addition to these

mitigating strategies, we also need to accept the unavoidable effects of climate change and adapt accordingly.

We need to control and limit global warming, deforestation and hunting as mitigations to increase the longevity of Earth. Global warming is caused by increased greenhouse gas (such as carbon dioxide) emission from burning fossil fuels like coal, gasoline, and oil. Global warming is believed to be a leading cause for climate change and is one of the biggest threats to life on earth today. “The Earth’s global average temperature has increased by 1.9 degrees F since 1880” (“Temperature: Why is Earth’s”). Though this may seem insignificant, these few extra degrees are melting the polar ice caps, causing sea levels to rise. When sea levels rise, coastal cities and towns may get flooded, destroying life and property. Melting polar ice caps also results in habitat loss for polar bears and other animals, causing them to become endangered species. Deforestation also leads to increased carbon dioxide, since plants take in carbon dioxide and give out oxygen (Schwartz). Another severe outcome of deforestation is the destruction of many animal habitats. If we cut down all the trees, these animals have nowhere to go, causing some species to go endangered, and even extinct. In addition, animals are also becoming endangered and extinct from hunting. Humans hunt animals not just for food, but for other resources. For example, tigers and leopards are hunted for the patterns on their fur that people use as clothing to wear. Therefore, we need to act with urgency and take measures to regulate global warming, eliminate deforestation, and limit hunting to protect the future of our planet.

There are some critics that do not believe in global warming and climate change and many who believe that hunting is necessary for food and survival. People often say, “how can global warming be real if it is so cold outside?” This is a misperception, because the temperature on a certain day is not reflective of the Earth’s global temperature. Others might argue that fossil fuels are essential for most people in the world to have access to electricity. While that may be true, there are alternate renewable sources of energy such as solar, wind, and hydroelectric power that can supplement fossil fuels and

reduce the carbon in the atmosphere. Electric cars are another recent innovation that can reduce the consumption of fossil fuels. Transitioning to renewable sources of energy could save the global economy 160 trillion dollars in climate change costs by 2050 (Ellsmoor). Another claim is that deforestation is not as important as climate change; however, they are connected. If we had no trees, we would eventually die because there would be no way to ‘recycle’ the carbon dioxide we breathe out. With the increased global population, humans do need to consume plants and animals for food. However, destroying animal habitats to build roads and cities, driving grizzly bears to extinction or poaching elephants for their tusks is not required for human survival. Despite what critics say, climate change, global warming, deforestation, and the growing list of endangered animal species are serious concerns and must be dealt with immediately.

We need to implement mitigation strategies to bring back the balance between people and nature. We can start by creating awareness of the damage we are causing to Earth. “Despite increasing awareness of climate change, our emissions of greenhouse gases continue on a relentless rise” (“Responding to Climate Change”). Reducing dependence on fossil fuels and planting more trees can reduce the carbon dioxide levels in the atmosphere. We can also help by conserving natural resources. Simple acts such as conserving water and electricity, recycling paper and plastics, and reducing food wastage can go a long way in protecting the Earth. Composting foods can help reduce the amount of waste that ends up in landfills. Adopting a few manageable acts to mitigate the risk of climate change can save our environment.

In addition to mitigation strategies, we also need to have an adaptation strategy where we prepare ourselves for the future harmful effects of climate change. “Since 1870, the sea levels have risen by about 8 inches” (“11 Facts”). Coastal towns and cities need to plan for potential flooding from rising sea levels. Some other adaptation strategies include managing risks from severe disasters, planning for reduced water availability, and developing crops resistant to extreme climates (“Responding to Climate Change”). Finally, we need to take

more steps to protect endangered birds and animals by preserving their natural habitat. In order to safeguard the future of the Earth, people need to not only find ways to limit future damage to the environment, but also prepare for future adverse impacts of climate change.

Scientific innovations over the past several decades have improved the overall quality of life for people. However, these discoveries have also damaged the environment and created an imbalance between people and nature. Global warming caused by fossil fuels and deforestation, as well as extinction of various plant and animal species through the destruction of their natural habitats are examples of how people have affected the environment. Further, human acts such as hunting have endangered several species of animals. We can reverse these trends by taking simple steps to conserve and protect the environment. In addition, we need to plan for a future where we can survive the harmful effects of climate change. It is highly important we accept the reality of climate change and take immediate action to create a future where humans and nature can thrive.

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A Greener, Better Future For Everyone



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INTRODUCTION

The world has changed dramatically over the last half-century. The human population has more than doubled. The population of several other species around the world has fallen by an average of 68% (The Economist). These changes are caused due to the climate crisis, loss of biodiversity and wildlife, the lack of food and water, air and trash pollution, and so on. Humans have used more resources on the Earth than any other species. Excessive consumption of Earth's resources by the human species has altered the Earth profoundly and permanently. If we want to have a balance with nature, we have to do something to change the way we operate so that humans and nature can co-exist. One of the most pressing questions of our times is: How do we create a future where both people and nature can not only survive, but thrive?

POSSIBLE CAUSES

There are several human actions that could have caused these detrimental effects on our planet. One of the major causes is pollution---air, water and land. Air pollution is caused when factories, cars, machines and wildfires emit

harmful gases like carbon dioxide and carbon monoxide into our atmosphere. These toxic gases could have very damaging effects on living organisms. The ozone layer, the layer that protects us from harmful rays from the sun, has disappeared because of air pollution and has led to global warming. Water pollution is caused mainly by factories and industries dumping toxic chemicals and substances into rivers, lakes and seas. It is also caused when plastic and other similar materials make its way from land to water. These chemicals can harm marine life and possibly drive them into extinction.

Trash pollution is yet another cause of environmental damage. When trash is not handled properly, it can travel a long way. For instance, from landfills it travels to rivers and then to oceans. When living organisms including marine life come into contact with harmful substances and plastic that may be present in the trash, it could poison or maybe even kill organisms. According to the publicly available statistics, every year 18 billion pounds of plastic/trash have been dumped into the ocean! According to Julia McDonald of dumpsters.com, an average American produces about 4.5 pounds of trash a day and an average family produces about 18 pounds of trash a day. Every year, an average American produces about 1,642 pounds of trash a year and an average American family produces about 3,570 pounds a year. Plus, every year U.S. landfills are filled with 139.6 million tons of waste (Julia McDonald). Even if a percentage of the total trash makes its way into oceans and other places, it could cause a lot of harm.

The loss in biodiversity and wildlife could wreak havoc on our nature. Biodiversity is the variety of life on Earth. Biodiversity is very important because it can keep ecosystems healthy and stable. But guess what? Because of climate change and human activities, more animals have died, several species have gone extinct, and the ecosystems have altered so much. If we want biodiversity, we need wildlife. But the problem is we don't have that much anymore. This is because humans have converted most of the forests to residential areas and farming lands. This is called deforestation. Can you believe that 3 trillion trees were cut down? (WWF International). Trees provide a lot of oxygen to us and they also take in carbon

dioxide which is very good. This harms the environment because there is more carbon dioxide in the atmosphere and we won't get that much oxygen anymore which is very bad.

According to the Economist magazine, 1.3 billion tons of food is squandered every year. 750 billion dollars worth of food is thrown away every year. If we are wasting food, this is equivalent to wasting the scarce resources that could have been used by other species. For example, to produce 1 kilogram of grain requires 1,500 liters of water (The Economist). The waste of water is also an issue for many people around the world. According to "savethewater.org", the average American uses around 2,000 gallons of water everyday! This includes water used for drinking, taking showers, flushing the toilet and so on. According to the World Bank, two-thirds of the population will have a shortage of fresh drinking water by 2025 (Save the Water).

POSSIBLE SOLUTIONS

Despite the fact that there are so many issues, we can still save the planet with the appropriate schemes and approaches. For pollution, there are a lot of things that we can do. First, we have to stop burning fossil fuels, and transition to renewable and clean energy to operate our vehicles, industries and factories. For example, we can use sustainable energy such as solar and wind energy to power our houses and industries. One interesting way to harness more solar energy is to use giant solar farms in space that would collect all the radiation from the sun and it would just beam on to the Earth (TDC). But the question is the following: Is this practical and can we afford it? Another idea is to use tidal power (TDC). We also need to re-wild the Earth and create more forests. We need to plant as many trees and as many diverse species of trees so all the animals can have a habitat and the ecosystems will be stable again. If we can do all of these things, biodiversity will come back.

Another thing we need to do is to protect and preserve our oceans. We have to use more recyclable and biodegradable products and reduce our dependence on plastic. A search engine called OceanHero says that every five searches you do,

one plastic bottle from the ocean will be removed (OceanHero). We need to invest in better technology and fishing techniques that will ultimately reduce over fishing and create a sustainable way of fishing. "Efficient farming is producing 20 times more food with 4 times less water," says Ernst van den Ende of Netherlands. For our part, we can cut down the amount of water we use in showers, toilets and faucets. These simple acts can make a big difference.

There are many things humans can and must do immediately to prevent the decline of species. Things like using renewable energy instead of non-renewable energy, not wasting food and water, and re-wilding our planet will give a big impact if everyone does their part. If we can all act responsibility and do our part, we will still have hope. This is the only planet that is sustainable for us to live in. Time is running out and if we want life on Earth to flourish, then we must act NOW!

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Fighting for Our Lives, and Animal Lives



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The animal trafficking system is a detrimental business to animals and people. In a world where we could lose fifty percent of all species in the next hundred years, we are running out of time. Endangered species are diminishing at a much faster rate than they should be. Only one species should go extinct for every one million species every year in a healthy and balanced environment. This balance is not the case for our world. Animals and our environment suffer from biodiversity loss because of this cruel business. Humans put their life on the line to catch these beautiful creatures to put food on the table. Each side of this problem is fighting for their own lives differently. It does not have to be this way.

The animals that are being targeted in the illegal wildlife trade happen to be critically endangered. Pangolins, a shy nocturnal mammal that looks like a combination of an anteater and an armadillo, is the most trafficked species on the market. They are primarily sold for their scales which are used in traditional Asian and African medicine. There is no proof of this medicine being effective, however, so millions of pangolins are slaughtered. Dr. Mark Ofua, a veterinarian in Nigeria, works to educate the public on these animals' importance. "When you try to tell hunters, these animals are on the brink of extinction. They laugh at you and tell you that is impossible." ("Nigerians" Ofua 00:2:23 - 00:2:29) Educating the world on why these creatures are essential is crucial for our

survival and their's. "Nature determines our survival." ("How to Save Our Planet" Attenborough 00:01:01 - 00:01:02) With biodiversity losses, the food chain risks failing apart for the animals and us.

Every abiotic and non-biotic factor is essential for our world's survival. One animal's extinction could be the downfall of our world. Back to pangolins, for example, they eat seventy million bugs each year. Without them, crops will be destroyed. Pests will increase. The extinction of one species threatens the world's agricultural system. "Fundamentally, Biodiversity is the key to the future of humanity." ("Our Planet" Rockstorm 1:24- 1:25) Our overfishing and exploiting animals for our own profit cause various species to show up on the market. "You can go down streets, and every other shop will be full of endangered creatures. It's not just shark fins. It's just about everything endangered, in the world is for sale there." ("Racing Extinction" Psihoyos 00:17:47 - 00:17:59) Without biodiversity, the systems our society has built up over the years would fall apart. Millions of individuals around the world would be left unemployed. "And you know what was interesting is that you can build up an economy and culture for hundreds of years and it can be wiped out overnight. Unless we protect our environment, protect our ecosystems." ("Our Planet" Smith 00:14:27 - 00:14:33) We need to protect the ecosystems that our agricultural systems rely on for all our planet's inhabitants.



Lamakera. Credit: Shawn Heinrichs

On a secluded island in Indonesia called Lamakera, the inhabitants rely on manta rays to survive. In Nigeria and

other parts of Asia, hunters rely on pangolins to put food on the table. These hunters are not necessarily bad people; they do what they need to do to sustain themselves. Many hunters know that these creatures' numbers are diminishing but are uninformed on making a profit without destroying the species. Lateef Yinusa, a village trader in Nigeria, has been capturing pangolins and various other species to provide for his family.

"We are traders, thirty years we have been doing now. You know that everything is expensive. Like food, it is expensive and different from before. Now we buy a bag of rice for 20,000 naira (56 USD). The bag of rice will not last us two weeks." ("Nigerians" Yinusa 00:3:09 - 00:3:28) Kepala Desa, the chief of Lamerka, is in a similar situation. The only way his people can survive is by selling manta ray parts to Asia. "Hunting mantas is our main source of income, and it pays for our children's education. We don't have agriculture; we can't grow any plants. We don't have another choice." ("Racing Extinction" Desa 1:04:24 -1:04:48) When the natives of these locations were educated on the importance of these animals and given alternatives for making a profit, they were keen to cooperate.

The question we ask ourselves is how these individuals will provide for themselves in the coming years. Teaching the locals how time is running out for these creatures is the first step in the right direction. However, we cannot stop there, as did the conservationists in Isla Mujeres, once the biggest shark fishing island on Mexico's coast. More than twenty fishermen targeted these sharks every day. These ex fishermen now take tourists out to swim with sharks and produce a more significant profit than killing sharks. "It's just simple economics," says Shawn Heinrichs, a marine conservationist. ("Racing Extinction" Heinrichs 00:16:01 - 00:16:02) We only have one world, but we have multiple ways to save it.

The most direct and most complicated solution for protecting these species is to stop the demand at the source. To dismantle the companies and enterprises that fuel the destruction of these species. That is what CITES is "trying" to

do. "The only law that we really had to protect endangered species is CITES. CITES is the convention for international trade of endangered species. And there are only a few hundred animals that are actually on that list. And part of the reason is because the people who control CITES are actually in the trade of selling them." ("Racing Extinction" Psihoyos 00:48:23 - 00:48:44) Someone has to do the dirty work. So, the hunters slaughter the animals while they receive little to no profit. The hunters cannot stop the demand alone; we need to work together to end animal trafficking.

As our world's resources slowly diminish, it is up to us to protect them for our sake and the animals. By disrupting the animal trafficking industry while educating the world on the importance of endangered species is the only way, all inhabitants on this planet can thrive.

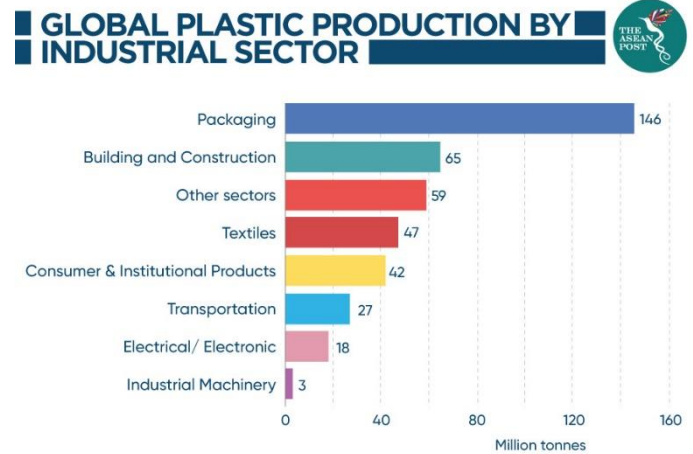
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Can we reverse the human-caused damage? “(Plastic) is in many ways a miracle product cheap to produce and virtually indestructible. Yet plastics blessings are also a curse” (“Pegasus” Narrator 00:015:25-00:015:35). When plastic was sold to the public plastic was life-changing. It was marketed as something that would last forever. Fast-forward to 2021. Packaging makes items eye catching to consumers. Making products eye catching has been more important than our environment as evidenced by the manufacturers who produce loads of plastic packaging. Now, we have to deal with the consequences of overmarketing this inexpensive product. As the narrator states in the video, “Pegasus, Plastic Plague”, this cheap and indestructible material is lasting forever. Sir David Attenborough explains that “Scientists have decided that Earth has entered a new phase of its existence welcome to the Anthropocene, the age of humans” (“How to Save” 00:01:35-00:01:46). We are polluting the planet so we must take responsibility and save our earth. Plastic is clogging up our fresh water, filling our landfills, and polluting our oceans. Recycling plastic and building houses with reused plastic would benefit the future of animals and humans coexisting.



Great Pacific Garbage Patch. Credit: The Ocean Cleanup

How many times a day do you use something plastic or throw away plastic packaging in the trash? We can't go outside without seeing the pollution plastic has caused. Plastic pollution is all around us. When going on a walk or traveling to the beach, plastic is everywhere. Three-hundred-eighty-million tons of plastic are produced every year (“Ritchie, Hannah”). Plastic is either recycled, burned, or dumped in a landfill (“Pegasus” Narrator 0:23:42-0:23:49). Ultimately, plastic ends up in the ocean. The motto ‘reuse, reduce and recycle’ isn't working. In fact, ninety-one percent of plastic isn't recycled (Parker, Laura “A whopping 91% of plastic”). Most of the plastic ends up in the Great Pacific Garbage Patch or washed up on beaches. Eight-million metric tons of plastic end up in the oceans every year (Parker, Laura “A whopping 91% of plastic”). The ocean's ecosystems have depleted due to debris floating in it. Further, the ripple effect on the food chain can be seen. You are what you eat. This saying proves true when fish and birds' natural instincts and behaviors are impacted after

they eat the harmful “food” (Savoca, Matthew). The schooling size of many species of fish plummeted and fish started tracking the smell of plastic (Savoca, Matthew). “More than 200 animal species have been documented consuming plastic” (Parker, Laura “Animals Eat Ocean”). “By 2050 there will be more plastic in the ocean than fish” (“Pegasus” 00:26:04-00:26:08). Further, due to ocean tides and currents, these ground-up microplastic particles are found on the ocean floor which makes them accessible to thousands of animals. Lastly, when plastic is ingested, it clogs up the insides of the fish because it cannot be digested. It acts like a poison. Plastic has done nothing good for our earth. Marine life, the oceanic food chain, and fish viewing plastic as nutrition is detrimental to our environment.



Many seabirds, fish, whales, and other critters are gobbling up so much marine plastic debris. Credit: National Geographic

Boyan Slat is a Dutch inventor and the CEO of The Ocean Cleanup (“Pegasus, Plastic Plague”). Slat has won many awards including European Entrepreneur of the Year in two-thousand-eighteen. Slat designed a giant device that collects debris in the ocean (“Pegasus, Plastic Plague”). His thought process is to get the plastic out of the ocean. While Slat’s idea is valid, to clean up the world’s oceans, what will we do with all the plastic when it comes on land? After all, it ended up in the ocean due to the lack of space. As consumers, we need to be more cautious and aware of what happens to our products after we are done with them. One way to reduce excess plastic in the ocean and on land is by creating building material out of recycled plastic. Melting down unwanted plastic and turning it into usable bricks to construct houses is the way of the future. Creating homes or businesses would be a resourceful way to

reuse plastic in a problem-solving fashion. Houses structured with this alternative building material are earthquake-resistant, fire-resistant, and insulate heat more efficiently than traditional materials (Nicolás, Valencia). A benefit to owning one of these houses is the guarantee of how long the house will last. Due to being made out of plastic Isabel Cristina Gamez, the CEO of Conceptos Plasticos proclaims the house will last for more than five-hundred to six-hundred years (“How Recycled Plastic”). Another bonus to owning a house made out of this material is the low price of plastic and how easy they are to assemble. These bricks are akin to Legos. Many companies across the world have succeeded in assembling this new form of housing. Ecodom, ByFusion, and Conceptos Plasticos are three large companies that are cleaning up the planet one house at a time. Conceptos Plasticos, a Colombian-based company, has transformed five-hundred tons of waste plastic into forty-three-thousand square feet of housing (“How Recycled Plastic”). Óscar Méndez the founder of Conceptos Plasticos states that they can use “shampoo bottles, food wrappings, garbage cans, and plastic chairs” (“How Recycled Plastic” 1:29-1:35) to melt and create homes for the less fortunate. Another impressive quality of these structures is that one can disassemble the house and move it to a different location and rebuild easily. The bricks only weigh six pounds (Nicolás, Valencia). The assembly is so easy a two-story house can be constructed in five days with a four-man crew (Nicolás, Valencia). Lastly, these attributes could benefit third-world countries or places that recently suffered a natural disaster. Creating a safe home for people in need using recycled plastic and creating safer homes for fish is a win, win situation.

Picking up a water bottle, throwing away trash, and repurposing old items would all contribute to a healthier ocean. A healthier ocean is a great start to a sustainable future. If we take steps to improve our environment and reduce the trash in the ocean there will be more opportunities for jobs. These jobs include ocean cleaners and factory workers to melt the material. In addition, house assemblers or disassemblers will be necessary. This will create jobs in the near term and shelter for years to come.

The going rate for one of these houses of the future is six-thousand-eight-hundred dollars (Nicolás, Valencia). This amount includes materials and labor. This would open up a market for millennials, homeless people, and others. This in turn opens up possibilities to people of which homeownership may not have been attainable.



This House was Built in 5 Days Using Recycled Plastic Bricks. Credit: Conceptos Plasticos

Why not take a negative and turn it into a positive? The negative is the trash that clutters up our environment and the positive would be the homes that it could create. Slat claims that “We are in the middle of the plastic age” (“Pegasus” 00:19:10-00:19:13). By removing plastic from the ocean our planet will be healthier and cleaner. Cleaner environments mean healthier animals. How can we restore the balance with nature? By owning up to our previous mistakes and taking positive steps in the future. Our earth must sustain generations to come, not just the generation that is creating plastic in 2021. Recycling plastic and building houses with reused plastic would benefit the future of animals and humans coexisting.

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Water. Land. Atmosphere. Home.

“What makes our planet a remarkable dwelling place for all living beings are these unique gifts of abundant water, bountiful land, and a comfortable atmosphere.”

- DR. HIREMATH



Sustainability in Style



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Since the Industrial Revolution and growth of business, humans have been taking control of nature's power in the world. While people focus on their success, they have neglected the environment's importance to life. Due to this neglect, "We're now totally out of balance with nature. And unless we get our balance back, this age of humans is due to be short-lived" ("How to Save Our Planet" 2:04-2:16). Unfortunately, major industries have done a significant amount of damage. The fashion industry is extremely beneficial for people, being a facet in everyday life. Everybody wears clothes; however, it needs modifications to encourage balance with the environment. An absurd amount of waste is created by the production of textiles and apparel, wasting natural resources such as water, and it is all bound to end up in landfills. Now that the environment has become a growing concern, "The fashion industry is undergoing important changes in how it manufactures clothing, and it's making it easier for consumers to be conscientious when they shop" (Anzia). By extending the textile life cycle and developing eco-textiles, the fashion industry has the ability to become more sustainable, fostering growth of the environment and humans.

Nowadays, people are buying cheap, low-quality clothes frequently, worsening the environment while doing so. Since these clothes are not made well or made from poor materials, it shortens the lifespan of the product. The average textile life cycle is monitored so people are able to see how often they create waste with what they wear. This life cycle is composed of "product design, fiber production, fabric manufacturing, cutting and tailoring (including finishing), transport, storage and sales, to use and reuse by consumers, and finally to either textile recycling, or waste generation and subsequent landfill or incineration" ("The Life Cycle of Clothes"). One contributor to this waste is the increase of trends. Ever since World War II, brands were broken into two seasons: Spring/Summer and Fall/Winter. This provided designers and brands time to gather customer data, create quality products and advertise. However, the growth of fast-fashion trends has changed this number to eleven seasons per year ("The Future of Fashion"). People are not only purchasing more clothing, but keeping it for half as long (Anzia). This creates an unnecessary abundance of clothing but also demands excessive work and resources. A shocking report in 2017 found, "...in 2015 alone, the fashion industry consumed 79 billion cubic meters of water..." ("Water and Clothing") This number is only increasing, making people nervous due to the shortage of water resources.



Textile offcuts in Bangladesh. Credit: Mohammed Anwarul Kabir Choudhury/Alamy

This environmental issue causes people to consider alternatives to lower consumption and waste. Many are turning towards shopping second-hand to reduce waste and to lengthen

the textile life cycle of certain pieces. Second-hand clothing is a way for everyday people to contribute towards making the fashion industry greener. In addition to buying and donating to thrift stores, the concept of slow-fashion is becoming more popular too. This is a more sustainable approach to producing, selling and purchasing apparel. Slow-fashion is effective by urging people to “...buy less garments at higher quality, made from more sustainable processes, less often. It also puts emphasis on the art of clothes making and celebrates the skills of the craftspeople who make them” (Hill). The slow-fashion approach is ethically driven, giving opportunities for the environment to flourish while keeping consumers and designers happy. Although it is a more expensive practice, it is reasonable to lower the waste produced by the fashion industry while keeping customers satisfied with the quality and quantity of clothing. Also, this benefits the workers by allowing them to be paid a fair wage. The more dangerous side of fast-fashion in production where, “Many fast fashion brands manufacture low-cost, low-quality apparel in factories with questionable working conditions, relying on workers who receive low pay. The inexpensive materials used to create cheap garments are also laden with chemicals” (“The Future of Fashion”). Not only is it harmful towards the environment, but it also is cruel towards humans. Many people who buy clothes from cheap brands ignore the harmful impact on workers; They would rather focus on the personal benefits of fitting in with trends. The slow-fashion alternative gives clothing a deeper meaning rather than focusing on social status. A slow-fashion mentality encourages environmental consciousness, individuality and growth from the less ethical option.

Even before the manufacturing and selling of apparel, textiles are made. Common textiles are polyester, cotton and silk, but these fabrics are terrible for nature, filled with chemicals and requiring too many resources. Polyester is a synthetic, non-biodegradable fiber produced from chemicals (Davis). These characteristics of polyester are harmful towards the environment and humans. The only end result of polyester is sitting in a landfill or incineration. Another unsustainable textile is cotton. Media has created a warped idea of how cotton impacts the environment. People assume since it is a

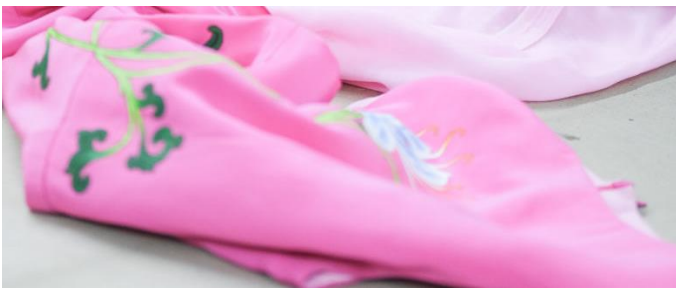
natural fiber, it is better than others. Contradictory to this belief, cotton takes plenty out of the environment: specifically, water. Shockingly, “To produce just one cotton shirt requires approximately three thousand liters of water” (“Water and Clothing”). Similar to cotton, silk, a natural fiber excessively uses resources. Instead of water being the main concern with this textile, the demand for energy is the most damaging. This comes from how “Silk farms are kept at a certain humidity and temperature (65 degrees). Because most silk is made in hot climates in Asia, that requires a large amount of energy for air conditioning and humidity control” (Wicker). The production of chemicals, waste of water and waste of energy are all reasons to switch to alternatives. However, these materials are found in nearly every person’s closet, emphasizing the need for reform.



Sustainable design. Credit: Orange Fiber

The issue of unsustainable materials motivated the development of eco-textiles. These are the future of fashion, providing no waste and many interesting advantages. One eco-textile is muskin, a fabric created from fungi. It is a possible substitute for leather and suede, having a similar thickness, texture and flexibility. It is created by Mycelium, the vegetable part of a mushroom (“Fabric Made From Fungi”). This is easily grown, requiring little energy, uses no toxic chemicals or fertilizers and requires an extremely low amount of water compared to fabrics like cotton. This innovation is able to aid the industry with its fight to being environmentally conscious while having major advantages for people as well. Muskin is antimicrobial, suitable for sensitive skin, “...non-toxic, waterproof, and fire-resistant” (“Fabric Made From Fungi”). People can help the environment by wearing this fabric and get

these extra bonuses for themselves. A more popular eco-textile is fabric made from orange peels. The Italian brand Orange Fiber was created in 2016, exclusively producing textiles made from citrus juice byproducts ("Orange Fiber"). This material is a substitution of silk with its soft, lightweight and luxurious feeling. The brand constructs a cellulose yarn which can be blended with other materials ("Orange Fiber"). Similar to the fabric made from mushrooms, it does not use much energy, water or toxic chemicals. Many people are skeptical of the lifespan of fabrics made by fruit or vegetable waste, but biologists work with the material to make it sturdy and unable to decompose while wearing. In addition to these innovations of eco-textiles, fabrics from pineapple are being made along with the commonly known environmentally friendly materials such as hemp and bamboo. Biologists and designers have finally found how to make the industry beneficial to the planet while fulfilling needs of people with this marvelous creation. Soon these textiles will become common in every store and closet since it is the greener alternative to cotton, leather, silk, polyester and suede. Big stores such as H&M have already integrated these practices in their merchandise. A collection of clothing entirely made of orange peels is available now for customers. It is inspiring to see the brands improve their practices to fit the concern with the environment. Sustainability in fashion starts with the production of textiles, making it crucial for consumers and businesses to get in on this creation.



Silk causes environmental damage. Credit: Orange Fiber

Since clothing is a necessity for humans, providing creativity and coverage, it is crucial to not make this necessity for humans harmful to the planet. People have begun to realize fashion's damage on the ground it started from, entailing a resolution to fix the balance between humans and nature. Each person can contribute somehow, whether it is buying second-

hand, avoiding fast-fashion or buying eco-textiles. This is the consumers job, but big corporations are making their mark by acknowledging this rising issue and acting upon it. Luckily, the concern to fix climate change has found its way into conversations of business. Previously money was the only concern, but creating a greener business is a top priority for investors currently (Mufson). People have changed their lives, becoming more green to improve the future. The need for balance between humans and nature is strong, especially after humans took too much power from nature. However, these fixes can greatly impact the world, spreading sustainability to everyone.

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The Rights of Nature: a New Legal Solution in Which Humans and Nature Can Thrive



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Sir David Attenborough explains that humans are determining nature's survival as our global population will reach nearly 10 billion people in the next decade. Environmental legislation has been and will be a critical part of protecting our environment, and our own survival may depend on it. The Rights of Nature is a legal theory stating ecosystems should be treated as an individual rather than a piece of property. New Zealand, Ecuador, and Pennsylvania, serve as examples where granting nature personhood has set a legal precedent, and can revive damaged environments and replenish common resources. If nature is granted the legal right to simply exist, we will have a better chance at having a world in which both humans and the environment can flourish sustainably (What Is Rights of Nature?).

In the past, the legal process has helped establish such groundbreaking environmental legislation. In 1972, Disney released plans to build a ski resort in the Mineral King Valley, located in Sequoia National Forest. The Sierra Club sued the conglomerate, on the basis that the construction would interfere with park preservation, disrupt local wildlife, and cause significant habitat fragmentation. Ultimately, the Supreme Court ruled that the Sierra Club did not have legal

standing to sue, but this case played a leading role in the creation of the National Environmental Policy Act (NEPA). Under this act, Disney, and all companies that followed, were required to compose an environmental impact statement assessing environmental damage of any proposed projects. NEPA provided the necessary support for the Sierra Club to amend their lawsuit, and eventually, Disney changed their plans (Devin). Not long after, across the country, a community in Niagara Falls, NY, faced tragedy. The residents of Love Canal learned their community, schools and homes, were built on a canal that was used as an industrial chemical dumping site. Then, the serious health complications, such as cancer, that had plagued this sleepy town began to make sense. The community organized and sued both the federal government and Hooker Chemicals, the company responsible for the toxic waste. This lawsuit led Congress to enact the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) which holds companies financially accountable for their hazardous pollution (Schons). NEPA and CERCLA have effectively protected both the environment and people in the United States, but our planet and society continue to face major global challenges that will require creative and unparalleled solutions.

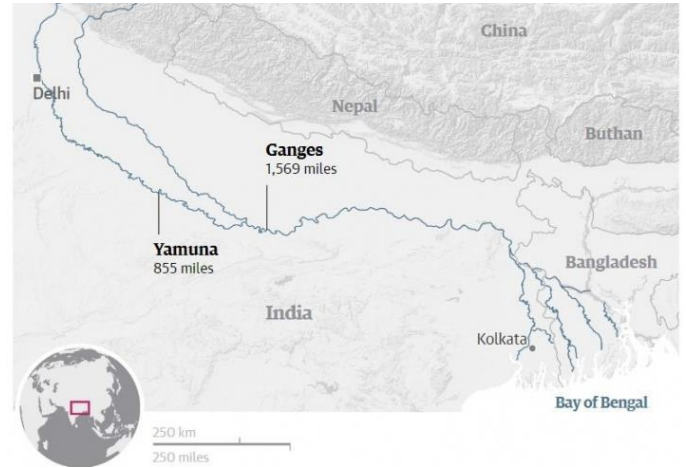


Whanganui River. Credit: James Shook

In the North Island of New Zealand, the Whanganui River flows, between two volcanic mountains. This river is the center of a landmark decision, in which the New Zealand government granted the river legal rights, in a clear statement to the world that nature should be treated as a person under the

eye of the law. For hundreds of years, the banks of the Whanganui River were home to the indigenous Maori people. “It was where they fished and lived. The water was used to treat the sick. They considered the river an ancestor” (Suri). When the British colonized New Zealand, the banks quickly developed into towns and the river was used for industrialized transportation. Under English law, the Whanganui River was seen as property that could be owned and controlled. The Maori, on the other hand, viewed it as an indivisible entity that should not be owned. For years the indigenous Maori and British colonizers fought over territorial rights to the river, and eventually the colonizers took control over the river. Nearly a century after the colonizers settled, the fish had been depleted, some endemic species became extinct, and sewage discharge and runoff from farms polluted the water. The river was essentially unusable by the Maori (Suri). Finally, in 2017, after years of the Maori and colonizers fighting in courts, the Whanganui River was recognized as an “indivisible and living whole” (Suri).

Now that the Whanganui River has the standing of a person in a court of law, it has set a precedent for environmental legal cases worldwide. Following this monumental court decision, the Whanganui River was appointed a guardian that speaks on its behalf, controlling what is built near or on the river; the guardian can even sue those who pollute the river (Messenger). Six years later, fish, ducks, and insects have returned to the river, and algae levels are well within normal limits. Granting the Whanganui River rights allowed the river to heal and regenerate, remedying the tragedy of the commons after years of unsustainable exploitation. The Whanganui River decision has created a significant shift in environmental law. In the years since the river became a legal entity, other countries including Bangladesh and India have adopted similar policies. According to Erin O’Donnell, “legal personhood could help with environmental protection of other natural resources” (Suri). If environmental lawyers and activists can fight to expand these rights to all of nature, we may be able to reverse some of the damage we have done to our planet, and move forward together.



Yamuna and Ganges rivers declared "living entities.". Credit: CNN

While countries like India, Bangladesh, and New Zealand are using the “Rights of Nature” movement to protect biodiversity and mitigate environmental degradation, Ecuador has taken it even further. In 2008 they ratified this concept of granting inherent rights to ecosystems and species into their Constitution (Ecuador Adopts Rights of Nature in Constitution). The Ecuadorian Constitution recognizes that the protection of nature is integral in any society, as our existence relies on it. The amendment states, “All persons, communities, peoples, and nations can call upon public authorities to enforce the rights of nature. To enforce and interpret these rights, the principles set forth in the Constitution shall be observed, as appropriate” (República Del Ecuador). In essence, nature is no longer seen as property under the law; rather, it's given the rights of a living being, and those rights are protected in the same way human rights are protected.

As the first country with a constitution that includes the Rights of Nature, Ecuador has become a model for what other nations should be doing to protect our global ecosystems. Ecuador’s addition to the constitution has played a critical role in environmental stewardship, particularly in preserving the Los Cedros Reserve – one of the most biologically diverse hotspots in the world. This forest contains over 200 species facing extinction, with “five of those regarded as critically endangered by the Ecuadorian government” (Hayden). This ecologically rich reserve lies on top of carbon stocks estimated to hold over \$210 million worth of oil (Hayden). Oil companies have been flocking to Ecuador in hopes of drilling

into this oil reserve, but due to the Rights of Nature constitutional amendment, extraction has been prohibited on the grounds that it would result in compelling environmental degradation. If the Ecuadorian judiciary committee upholds the amendment, it would set another important precedent, proving to the world how valuable a Rights of Nature amendment could be to preserving sacred biodiversity (Hayden).

The Rights of Nature movement has even gained traction in the United States, as a handful of local governments have incorporated these ideals into their constitutions. Grant Township, a small town in Pennsylvania, spent years battling with General Electric over the construction of a waste injection site to house the tailings of hydraulic fracturing for natural gas. Initially, the gas and oil company was granted a permit to build the site within Grant and the Little Mahoning watershed. However, the town grew increasingly concerned about the impact this well could have on the integrity of their drinking water. Community leaders decided to amend the local constitution to include a Rights of Nature clause in their "Community Bill of Rights" (Nicholson). Only weeks later, the State Department of Environmental Protection (DEP) cited this clause when revoking the permit, it previously granted to Pennsylvania General Electric for the well. For the first time in United States history, a natural entity was recognized as having rights in a court of law, and the citizens of Grant Township, and the ecosystem prevailed (Nicholson).

The fracking byproducts housed in waste injection wells can be incredibly damaging to the surrounding biodiversity and ecosystem. The drilling to create these wells increases both earthquake frequency and magnitude, which can release the toxic waste these wells hold into the surrounding groundwater and soil, risking the town's drinking water and the composition of the soil. In addition, there is severe habitat loss and fragmentation as a result of constructing these wells. Grant Townships Right of Nature Clause was able to prevent a waste injection site from being built, saving the area from permanent ecological destruction. If the Right of Nature concept can be introduced into state legislatures, and even the federal legislature, it would be a powerful tool for environmental

activists and lawyers, and would have a tremendous impact on the future viability of our planet (Nicholson).

Across the world, legislatures, large and small, are adopting Rights of Nature language. While it has yet to gain attention on a global stage, this paradigm shift could be the first step in solving many complex environmental problems. Treating trees, oceans, and animals as common resources or property is no longer a viable option. Humans are dependent on nature, and as humans continue to dominate the world, nature is now dependent on our actions. Sir David Attenborough was right; we are living in an unprecedented time, and it will take an unprecedented transformation in how we view and care for nature. If more communities, in different countries can amend their constitutions, and more policies can include this ancient philosophy, we may come closer to existing, and even thriving, in equilibrium with nature.

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Constitution of the Republic of Ecuador: Right to Nature



Ecuador is the first country to recognize Rights of Nature in its Constitution. A great first step for humanity towards a change of paradigm! Ecuador rewrote its Constitution in 2007-2008 and it was ratified by referendum by the people of Ecuador in September 2008. (GARN, Global Alliance for the Rights of Nature)

Ecuador's Rights of Nature embodies the indigenous Sumak Kawsay principles - Sumak Kawsay, or *buen vivir* in Spanish, meaning "good living" - giving constitutional rights to protect and restore its environment.



Title II: Rights. Chapter seven: Rights to nature

Article 71. Nature, or Pacha Mama, where life is reproduced and occurs, has the right to integral respect for its existence and for the maintenance and regeneration of its life cycles, structure, functions and evolutionary processes.

All persons, communities, peoples and nations can call upon public authorities to enforce the rights of nature. To enforce

and interpret these rights, the principles set forth in the Constitution shall be observed, as appropriate.

The State shall give incentives to natural persons and legal entities and to communities to protect nature and to promote respect for all the elements comprising an ecosystem.

Article 72. Nature has the right to be restored. This restoration shall be apart from the obligation of the State and natural persons or legal entities to compensate individuals and communities that depend on affected natural systems.

In those cases of severe or permanent environmental impact, including those caused by the exploitation of nonrenewable natural resources, the State shall establish the most effective mechanisms to achieve the restoration and shall adopt adequate measures to eliminate or mitigate harmful environmental consequences.

Article 73. The State shall apply preventive and restrictive measures on activities that might lead to the extinction of species, the destruction of ecosystems and the permanent alteration of natural cycles.

The introduction of organisms and organic and inorganic material that might definitively alter the nation's genetic assets is forbidden.

Article 74. Persons, communities, peoples, and nations shall have the right to benefit from the environment and the natural wealth enabling them to enjoy the good way of living.

Environmental services shall not be subject to appropriation; their production, delivery, use and development shall be regulated by the State.

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Acknowledgements

We would like to express our sincere thanks to the Hiremath family for generously donating their time, believing in the vision of bringing people together, caring for all inhabitants of our unique planet, and cherishing the planet.

We would like to express our sincere thanks to the Board of Directors for their time, dedication, and enthusiasm.

Thanks to our international panel of judges of the essay contest. Invaluable time of all volunteers and the financial contributions from individuals, Family Eye Care, and Pfizer Foundation are much appreciated. Thanks also to Staples for their in-kind donation.

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