EnviroLynx

SET.Hacks()

United Nations

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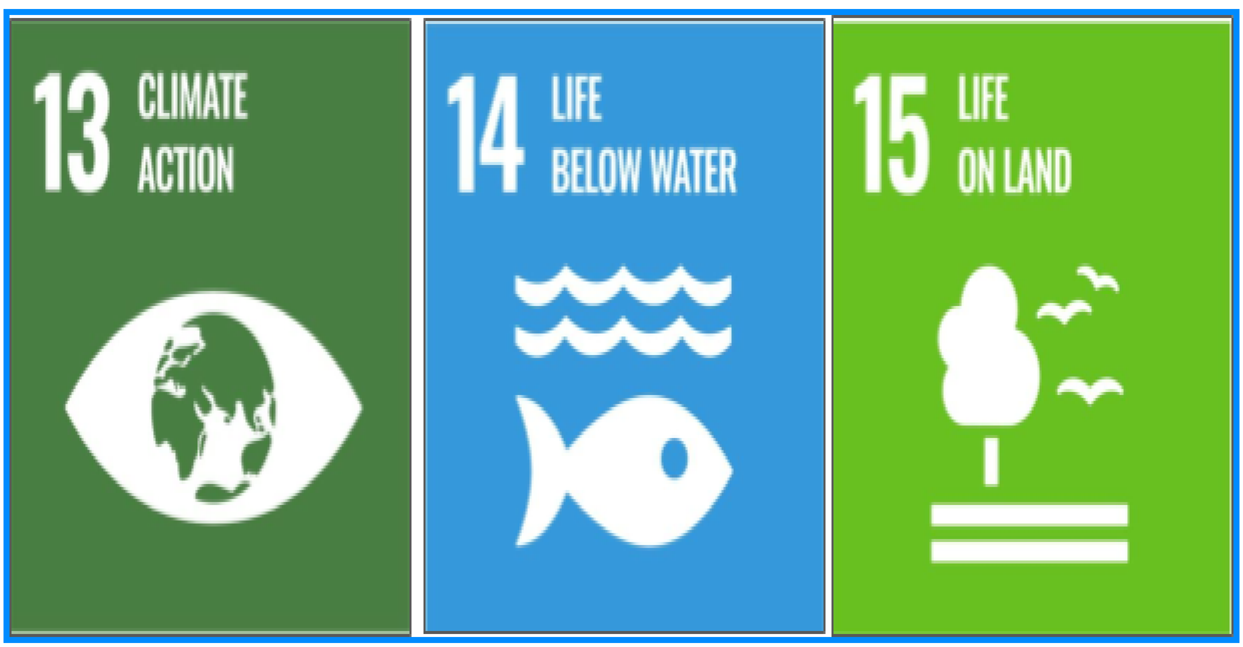
Introduction

The environment has been changing at intractable, unprecedented levels for the past several centuries. Global temperatures are at the pinnacle of human existence, and uncontrollable changes in the environment are growing more and more out of hand each year. To compound to this issue, humans have been consuming Earth’s natural resources at rates devastatingly beyond what our world can regenerate. As a result, the devastating repercussions of our actions are becoming evident --> We risk exponential losses of ocean / land life, and are on track to be encountering unsustainable living conditions for our future generations. If no immediate action is taken, according to the UN Intergovernmental Panel on Climate Change (IPCC), the effects of environmental changes will become irreversible by 2030.

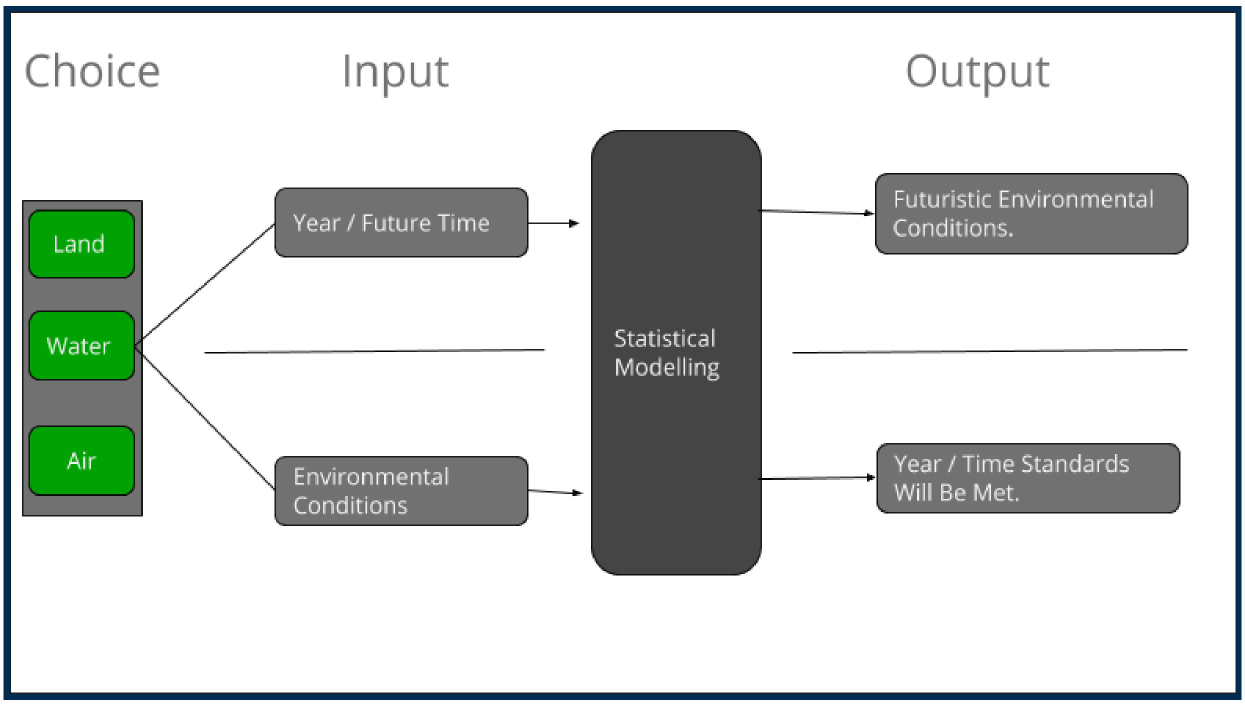
Driven by our passion to prevent the environment from wiping off human existence, and our ardent endeavours in STEM, our team proposes an application to help nations project estimated future environmental data and take relevant action in successfully achieving the environmental standards set through the United Nations Sustainability Goals (UNSDGs). More specifically, we provide blueprint data pertaining to: UN SDG Goal 13 → Climate Action; UN SDG Goal 14 → Life Below Water; and UN SDG Goal 15 → Life on Land.



Design Plan

Our tool will be a cornerstone of the sustainable environment plans of nations. It will allow nations to input quantitative data of optimal environmental conditions, and in-return, will output what year such conditions will be reached given the nation's current environmental sustainability policy. If this is not possible by 2030, it will additionally return the required adjustments to the nation's environmental sustainability policy that would yield successful results. The model utilizes quantitative data — which represents the historical magnitude of environmental problems, as well as factors of a nation's environmental sustainability policy — and statistical based learning, to project its output.

Back-end:



Our application will help gauge environmental changes through 3 main subsets/categories:

1. Air Conditions.
2. Water Conditions.
3. Land Conditions.

Air Conditions

Air pollution has grown exponentially over the last several centuries. This is having a detrimental effect on human health, wildlife, climate and global temperatures. At our current rate, droughts, floods and severe storms risk making life inhospitable in a multitude of locations on Earth.

The air conditions category of our model provides accurate blueprint data for the environmental changes in air conditions nations may undergo.

This is made possible through our streamlined process of quantitative data input, quality assessment of government sustainability policy, and statistical based learning.

Our Air conditions projector takes in 5 main quantitative data components in computing its output:

Year

Methane Emissions

Population Density

Nitrous Oxide Emissions

CO2 Emissions

Year / Current Time:

⟶ The current time is inputted into the model so recent environmental trends can be extracted from historical data. The time also assesses factors of a nation's environmental sustainability policies, and augments these into its output calculations.

Methane Emissions:

⟶ Methane emissions data is crucial in air condition projections, since methane emissions contribute pivotally to rises in climate. To put things into perspective, Methane has a global warming potential 84 times greater than CO_2 . It additionally accounts for around 10% of global greenhouse gas emissions, according to the Environmental Protection Agency (EPA). Around 60% of methane emissions are from human activity, according to the United Nations Environment Programme (UNEP), and thus, our model serves as a foundation for the amount of feasible methane emission reductions that can help propel nation's environment sustainability plans.

CO_2 Emissions:

⟶ Carbon Dioxide is the primary greenhouse gas emitted by human activity, and the lead cause of changes in air conditions. According to the Environmental Protection Agency (EPA), carbon dioxide accounts for around 81% of global greenhouse gas emissions and is the lead cause of air pollution. The precise use of CO_2 in our calculations is thus vital in mitigating the proliferation of detrimental air conditions.

Nitrous Oxide Emissions:

⟶ Nitrous Oxide Emissions are a main cause of changes in the environment, and according to the Environmental Protection Agency (EPA), accounted for around 7% of global greenhouse gas emissions. Nitrous Oxide additionally has a global warming potential 300 times greater than CO_2 and depletes the ozone layer, furthermore increasing global temperatures. As it also has a shorter lifespan, reducing nitrous oxide emissions could have a more immediate and pivotal impact on the trajectory of global warming. It is thus extremely important in the calculations of a nation's future environmental sustainability.

Population Density:

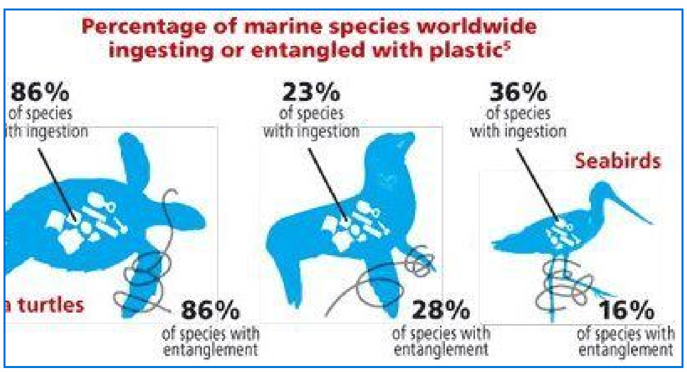
⟶ Population Density is taken into account in statistical based learning to suggest optimal usage of energy, as well projecting what may be feasible reductions in emissions.

Primary Related UN SDG Goal

Water Conditions

Water is essential for the environment. Without water, life on Earth would not exist. Water bodies produce more than 50% of oxygen within the atmosphere, and absorb 50 times more carbon dioxide than Earth's atmosphere. Water bodies act as stabilizers of global temperatures, and are home to significantly more life than the rest of our planet.

Despite this, sea levels have been rising at unprecedented rates over the last century, putting humans at severe risk. Increased carbon absorption of water bodies has resulted in alarming increases in ocean acidification, endangering millions of aquatic species vital towards our ecosystems. To illustrate, according to the National Oceanic and Atmospheric Association (NOAA), over the last 200 years, oceans basicity levels have dropped by 0.1 pH units. In other terms, this is a 30% increase in acidity invading aquatic ecosystems. As a result of these exponential increases in ocean pollution, species vital to our ecosystem are becoming extinct. At current rates, over 1 million seabirds; 300,000 dolphins and porpoises; and 100,000 sea mammals die from ocean pollution each year. If immediate action is not taken to curb these rapid changes in ocean conditions, water conditions may become irrepressible. As a result, Earth's environment may gradually become inhospitable for all forms of life.



Our model inputs a basic, yet comprehensive set of data pertaining to ocean conditions. Through assessing historical quantitative data, we precisely project a future representation of how aquatic life and ocean sustainability will plan out in the future.

Our well-planned quantitative inputs represents the following characteristics of water-bodies:

Year

Temperature (C)

Population Density

PH Scale

Seawater CO2

Year / Current Time:

⟶ Refer to page 6.

Temperature (C°):

⟶ Atypical temperatures of water bodies are the root measure of environmental changes. The temperature dataset of the water is thus vital in projecting future water conditions.

PH Scale:

⟶ The PH scale of a water body is a direct measurement of its acidity. It is therefore an extremely important quantitative data when assessing the acidity and pollution of water bodies.

Seawater CO2:

⟶ The carbon dioxide concentration in seawater is especially important when assessing ocean conditions, as it helps us project when impacts of CO2 levels in water may have serious effects on the environment.

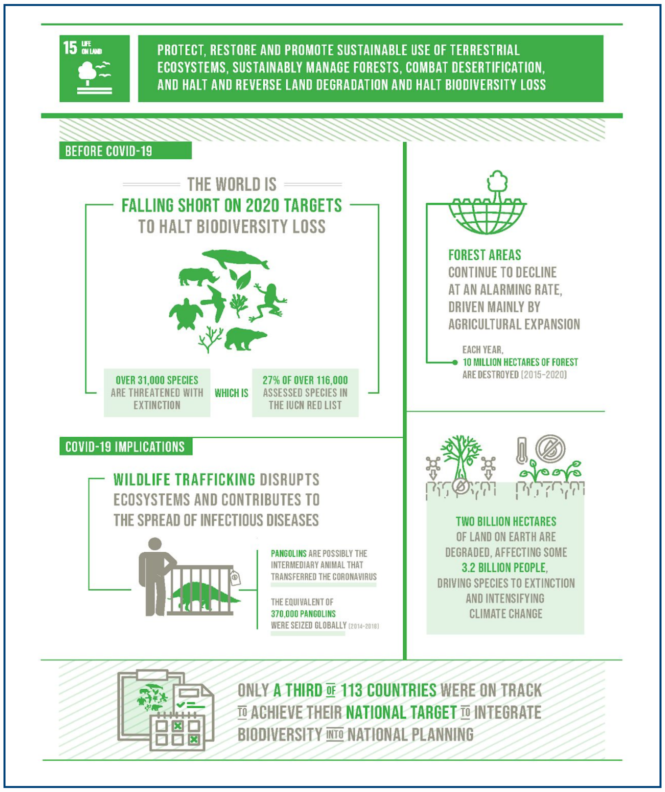
Population Density:

⟶ Refer to page 6.

Primary Related UN SDG Goal

Land Conditions

Over the past century, rapid changes in environmental conditions have continuously aggravated living conditions on Earth's land. These intractable changes in the environment have been manifested in increasing desertification, land degradation, and deforestation etc. As a result, terrestrial ecosystems and life on land are being subjected to an ever-increasing risk. If immediate action is not taken, it is inevitable that biodiversity will be lost, and subsequently... humans will become extinct.



Our model takes in optimal quantitative data that resemble pivotal factors to changes on land — such as desertification, degradation, and deforestation etc. —, and through advanced statistical based learning, projects accurate, foundational data on when such results can be achieved given the current structure of a nation's sustainability policies.

The main quantitative data it takes into account in its projections are:

1. Year / Current Time
2. Population Density
3. Agricultural Area (%)
4. Forest Area (km^2)
5. Urban Population

Year

Urban Population

Population Density

Agricultural Area

Forest Area

Year / Current Time:

⟶ Refer to page 6.

Agriculture Area:

⟶ The amount of suitable agricultural area is an important quantitative data, as it serves as an effective representation of the magnitude of an effect changing environments may have on land. On the contrary, agricultural practices also often entail harmful effects on the environment, including soil degradation, deforestation, waste, and pollutants. Among these pollutants include chemicals that are vital components in environmental temperature changes, such as: methane, nitrous oxide, and carbon dioxide. These binary effects of agriculture are both taken into account by our statistical based learning model that projects the environmental sustainability of land.

Forest Area:

⟶ Forest area is the most vital factor affecting life on land due to its hospitable conditions for biodiversity and its refreshing effects on air. Chiefly, its role as carbon sinks and effects in oxygen production. Despite this, forests are decreasing at an alarming rate. This rapid deforestation is a major cause of instability in the environment. According to the National Geographic, over the last 30 years, Earth has lost 502,000 square miles (1.3 million km^2). Our statistical basedlearning model henceforth utilizes forest area as a central component in projecting the sustainability of life on land.

Urban Population:

⟶ For the most part, Urban population negatively affects wildlife on land and the ecosystem. It converts natural habitat to urban built areas, extracts/depletes natural resources, and pollutes the environment. These factors are taken into account when assessing wildlife and projecting environmental changes through our statistical based learning model.

Population Density:

⟶ Refer to page 6.

Primary Related UN SDG Goal

15 LIFE ON LAND