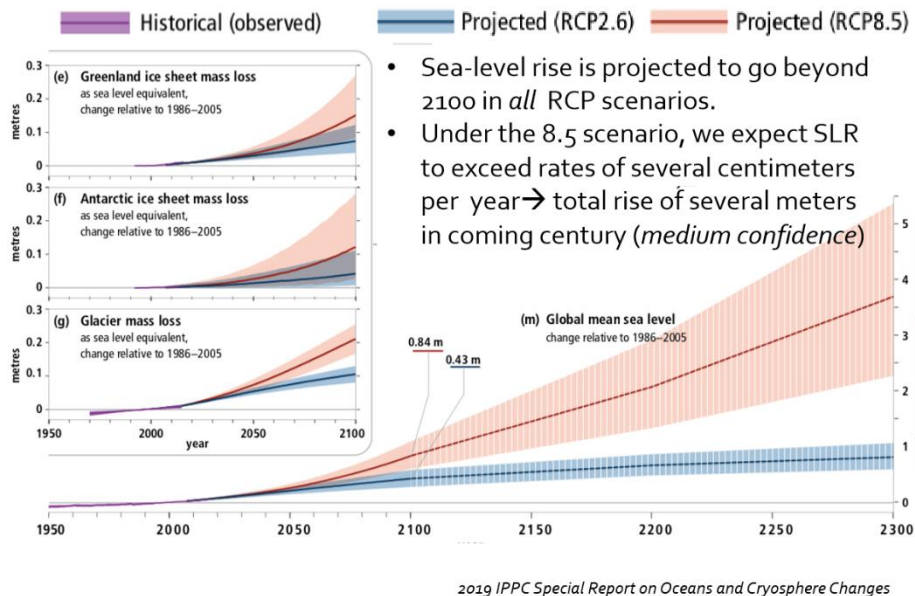


Will the sea of the future be colorful?

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To everyone who doubt the existence of anthropogenic impact on our beautiful nature



Forward:

Sea level rise has a very large impact on human society, especially for coastal areas. Many historical centennial events are expected to occur more frequently due to sea-level rise; also, some low-lying island nations like Maldives and Bahamas could disappear due to sea-level rise. Future sea-level rise depends on the concentration of greenhouse gases in the atmosphere, which mostly depends on the anthropogenic carbon dioxide emissions. If people continued to emit carbon dioxide without the improvement of regulation, many regions will submerge underwater by the end of the 21st century. Furthermore, as the concentration of greenhouse gases grows, the sea surface temperature will increase too, which will damage the marine ecological balance such as what I am going to talk about in my story.

My story is made up of two different future stories from the same perspective.

Under the 1st future (2300), people continue to emit carbon dioxide and other greenhouse gases, making the greenhouse effect continue to intensify, the rate of temperature rise becomes faster and faster. This intensified the melting of glaciers in Greenland and Antarctica, making the sea level in 2300 years higher than the average sea level from 1986 to 2005 by about five meters. The coastal areas of many countries are flooded with seawater, and some low-lying countries have lost all land. More than that, the average sea surface temperature in tropical areas exceed 25 degrees Celsius, which causes coral bleaching event to happen all around the world.

Under the 2nd future (2300), People start to reduce the emission of carbon dioxide and other greenhouse gases from the year 2020. Although this didn't stop global warming since the accumulated greenhouse gases in the atmosphere continued to rise the global average temperature, the good news is, the rate of temperature rise is much lower than before. By the year 2300, the sea level is about 1 meter higher than the average sea level from 1986 to 2005.

Possible Reality (2300)

“2020 is the beginning of the story. The rapid spread of the coronavirus has caused many businesses and the national economy to shut down, everyone completed their work at home, it is a difficult time for every human being. Although the spread of the virus was controlled at the beginning of 2021 by people's efforts, and the number of cases in the world was eliminated in 2021, it caused more than physical harm on people, also grow an idea in people's mind.

At that time, the economic losses caused by the shutdown of the companies, and the problem of global warming caused people to start discussing carbon dioxide emissions after the coronavirus ended. Reducing emissions means economic losses, and continuous emissions mean bad weather in the future.

After heated discussions, people believe that the economy is indispensable, and climate issues will always be solved in the process of economic and technological development.

This has led to a sharp acceleration of sea-level rise. It was only in 2150 that people realized that there was nothing that could prevent the sea-level rise. The only way was to fundamentally reduce carbon dioxide emissions, but it was too late at that time. The average annual carbon dioxide emissions in 2150 exceeded 25 billion tons carbon per year and the concentration of carbon dioxide in the air has exceeded 1000ppm. Even if people stop carbon dioxide emissions immediately, it is only a matter of time before Antarctica melts. That is why now, in 2300, many cities have been submerged by seawater, including Cairns, my great-great-grandparents' hometown..."

The bell rang after class. "Okay, the class is over, remember to finish your homework this weekend, next week we will talk more about sea-level rise", I say.

The Climate School was established after the World Climate Conference in 2150. It was established to let everyone fully understand the global climate situation, so as not to make regretful choices as in 2021. There is now a climate school in every city in every country. Students must go to Climate School for two years after they finish elementary school to continue to junior high school.

After finished my class, I run to the skyway (like subway but build in the sky) station in a hurry. I glance at my watch, "it's 4:20 pm, there should be enough time", I thought as I step into the skyway. Today is the death anniversary of my father Ryan, but I am not going to visit Ryan's gravestone but is rushing to the Australian Eco-Environmental Protection Center (AEEPC), where Ryan worked before that heatwave attacked him. The completion ceremony of the Great Barrier Reef Protection Device starts at 5:00 pm at AEEPC. For me, this is not only a big step in environmental protection, but also carries the feelings and input of my families to the Great Barrier Reef. I took a yellowed booklet out of my bag and it was full of pictures of the Great Barrier Reef in 2000. Although the resolution of these photos is not comparable with that of the

present, the colorful coral reefs are so dazzling. They look totally different from today's Great Barrier Reef, I once doubted whether the colorful Great Barrier Reef existed before. The man in the black diving suit is my great-great-grandfather Andrew, and this booklet has come to me from generation to generation. "I hope my father's efforts are not in vain", with the arrival reminder's sound, I put the booklet back in my bag and get off.

"It's here", I stand in front of the AEEPC's front door. I remember the last time I came here was the year 2274 when I was 5. At that time, I was shocked by my father's office since the models and blueprints looked so complex. "Why don't you leave more time with me and mom, this job looks so complicated and so boring", I asked my dad. He handed me a booklet and said: "Daddy is trying to find the color the world has lost. When the Great Barrier Reef looks like the photos in this booklet, I will come back home." I held my tears and told myself that today would be the day when my father's dream came true.

"We finally finished the Great Barrier Protection Device", my father's colleague Kevin says, "The blueprint of this device was designed by our deceased colleague Ryan, and we put his ideas into practice one and a half years after the completion of his blueprint. He wants to install his miniature thermostat on the coral of the Great Barrier Reef on a regular basis. The thermostat was covered by a thin layer of special taste which can attract phytoplankton algae back to the white coral. The thermostat can prevent the coral from repelling the algae that bring it nutrients, so as to restore the coral color and prevent the coral to bleach again. We also consider the effective working time and the recovery of the thermostat. It is estimated that the effective working time of the thermostat is about one month. The material used to make the thermostat can be decomposed by seawater, so there is no pollution to the seawater. Another problem that may happen is that the thermostat may be mistakenly eaten by fish. Although it will not affect the health of fish since it is so small and will not be digested by fish, it will lead to the loss of coral protection, so we add positioning devices to each thermostat, which enabled us to install new thermostats in time if anything happened to the old one. In terms of budget, if the Great Barrier Reef can be restored to color, there will definitely be many tourists visit the Great Barrier Reef, plus government subsidies, which should be enough." "My dad must be a genius", I thought.

“Ideas are always ideas, let’s see what will happen after we put this into practice. Now we are going to install these thermostats for the first time.”

All the thermostats are in position after two hours, the ceremony ends at the same time. I am still immersed in my father’s design. “Your dad is brilliant, Andy”, Kevin came to me and says, “Without him, we don’t have any hope of recovering the Great Barrier Reef.” “So how long will we know if this device work or not?” I asked. “According to our plan, the Great Barrier Reef can restore its color within two months, and then there will be a ten months observation period to see if the Great Barrier Reef can main its color or not. Generally speaking, it will take a year.” “Thank you”, I say and then I am on my way back home.

I look at my watch after I finish my noodles, it is 10:00 pm. I put my shoes on and go to my father’s gravestone. I take the photo of the Great Barrier Reef I took last year out of my bag. This photo is very monotonous. The white coral doesn’t give people a pure and beautiful feeling like snow. Instead, it makes people feel boring. These corals are like gamblers squeezed by casinos, they lose their proud colors and linger between life and death. “Dad will not want to see any coral in his world”, I thought. “Your device will definitely save the Great Barrier Reef, I trust you dad. Once the one-year observation period is over, I will bring you a picture just like pictures in that booklet but with much higher resolution.” I leave that picture in front of my father's gravestone and go back home.

The thermostat worked very well in the first two months, most parts of the Great Barrier Reef restores its color within one month, only half of the estimated time. I took pictures of the Great Barrier Reef every month. By the end of the 6th month, the Great Barrier Reef looks just like what they looked like in 2000. There are news and articles talking about the color restoration of the Great Barrier Reef, even some articles are writing about the economy after the Great Barrier Reef restore its color. It seems like everyone is confident that the Great Barrier Reef will maintain its color, so am I. The Climate School has a summer vacation in the following two

months. I plan to go to a far place tomorrow to take this month's photos. After I pack up what I need tomorrow, I go to bed and fall asleep with a mind full of colorful coral.

Things happen all of a sudden. It's not my alarm clock that wakes me up, it's the alarm that comes with my cell phone when the heat waves come. People have been used to the summer heatwave for a very long time, probably since 2200. Every time when I receive the alarm, I usually go back to sleep after reading it. However, this heatwave makes me extra awake, because I never saw this alarming level before, it is red.

I check the specific situation about this heatwave as quick as possible. The temperature of the heatwave reached 46 degrees Celsius. "Don't have ocean heat waves, don't", I pray in my heart. However, the fact tells me that the ocean heatwave is more serious than the land heatwave. The temperature of the seawater has exceeded 31 degrees Celsius! "I've never seen such a severe ocean heatwave. It is over...", I thought. Dad's thermostat cannot bear the unprecedented ocean heatwave. Sure enough, several hours later, several news media reported the bleaching of the Great Barrier Reef. A month later, Kevin was interviewed by the media. He said that the ocean heatwave was unexpected. The maximum temperature the thermostat can bear is 29 degrees Celsius. Because of the land heatwave, the new thermostat could not be installed in time. A few months later, scientists said: "Unfortunately, the coral bleaching event six months ago make the coral almost irreparable, and according to the frequency and intensity of the current and projected future ocean heatwave, the Great Barrier Reef is likely to disappear within 10 to 20 years.

I don't know what feeling I should have toward all of these facts. On my father's death anniversary, I didn't go to his gravestone as scheduled to give him the photos. I cannot bear to let him know the cruel fact... I wish this is a dream, what if people realized the anthropogenic effect on our Earth and take actions earlier? If people choose to reduce the amount of anthropogenic emissions, what will the world look like now? It is going to be a lot better, right?

Possible Dream (2300)

“2020 is the beginning of the story. The rapid spread of the coronavirus has caused many businesses and the national economy to shut down, everyone completed their work at home, it is a difficult time for every human being. Although the spread of the virus was controlled at the beginning of 2021 by people's efforts, and the number of cases in the world was eliminated in 2021, it caused more than physical harm on people, also grow an idea in people's mind.

At that time, the economic losses caused by the shutdown of the companies, and the problem of global warming caused people to start discussing carbon dioxide emissions after the coronavirus ended. Reducing emissions means economic losses, and continuous emissions mean bad weather in the future.

After heated discussions, most people think that protecting nature is prior to our economy. We can always make money when we don't have any, but we cannot build a new Earth after we lose it.

All countries put the wedge strategy (a strategy help people to regulate the amount of carbon dioxide emissions) into use immediately after the year of 2021. However, the implementation of this strategy is hard, many countries' GDP has declined by 30% or more compare with the 2010-2020 average. People were about to give up this strategy. Fortunately, in 2050, a man invented a device to filter carbon dioxide. It is like a water filter, its strainer can remove carbon dioxide from the air and reduce the carbon dioxide emissions. At that time, this device has saved the whole world from an economic crisis; meanwhile substantially reduced carbon dioxide emissions.

The inventor of this device is Frederick, my great-great grandfather's son, which is your great great grandfather." I answer my son Tony as he asked me about my company.

"So my great-great-grandpa saved the world?" Tony is immersed in the story I just told him, he seems to forget what he just asked me.

"Yes, of course, your great-great-grandpa saved the world, but don't forget your daddy is going to save the world too, I will inherit your great-great grandpa's company from today."

"Oh really? I thought I'm going to inherit that company from grandpa."

"You little monkey", I reached over and tickle his waist as I say. He tries to run away but tripped on the ground, and we both laugh at each other.

I start to ask myself since I was a little: "What should I do after I become CEO of Frederick Tech? Maybe continue to improve the power of the carbon cleaner?" To be honest, my father has improved the carbon cleaner device to the extreme. There is no possibility of further improvement in today's technology. I made my decision the night before I inherit Andrew Tech from my father. I remembered that when I was young, my dad gave me a yellowed booklet from my great-great-grandfather, telling me that it is as precious as an heirloom. He said that this booklet not only represents the fate of our family and the Great Barrier Reef but also carries a sense of responsibility to protect the beautiful Earth. Why not start with the Great Barrier Reef?

As I become the CEO of Frederick Tech, I have all the resources I need to know about today's Great Barrier Reef. According to the data, 25% of coral is in serious bleaching, the situation is not good; fortunately, it is not too bad, there is still time to fix this. After gathering all the information I need, I designed a miniature thermostat to help the bleached coral restore its color.

This took me 5 years to design the thermostat's blueprint. By the end of 2306, Frederick Tech finally finishes the thermostat and put it into use.

This miniature thermostat is designed to maintain the temperature of the coral by installing the thermostat on the coral of the Great Barrier Reef on a regular basis. The thermostat was covered by a thin layer of special taste which can attract phytoplankton algae back to the bleached coral. The thermostat can prevent the coral from repelling the algae that bring it nutrients, which helps the coral restore its color and prevent the coral from bleach again. I also consider the effective working time and the recovery of the thermostat. It is estimated that the effective working time of the thermostat is about one month. The material used to make the thermostat can be decomposed by seawater, so there is no pollution to the seawater. Another problem that may happen is that the thermostat may be mistakenly eaten by fish. Although it will not affect the health of fish since it is so small and will not be digested by fish, it will lead to the loss of coral protection, so in case we add positioning devices to each thermostat, we can always install a new thermostat in time after the old one has moved away. In case of the ocean heatwave event, I adjust the thermostat's maximum withstand temperature to about 31 degrees Celsius. However, the most serious ocean heatwave ever happened before only reached 28 degrees Celsius, I don't know why I adjust the withstand temperature to 31 degree Celsius, it is just my intuition. After the one-year observation period, 98% of the Great Barrier Reef is healthy and colorful.

"Is this a dream?" I ask myself. "Maybe, and maybe not, all I know is I would like it to become true."