United Nations Environmental Programme (UNEP)

Thomas Jefferson Model United Nations Conference

TechMUN XXXI

High School General Assembly

Co-Chairs: Claire Guo and Jia Mody

Thomas Jefferson High School for Science and Technology

April 12th-13th, 2024

Dear Delegates,

Welcome to TechMUN XXXI, and the United Nations Environmental Programme! Our names are Jia Mody and Claire Guo and we look forward to being your chairs and hearing your ideas on the given topics. This committee takes place on April 12, 2024. Each of the delegates will be representing a country, and we truly hope we will be able to see those countries reflected through your solutions. This committee will focus on two main topics: “Ocean Noise Pollution and its Impact on Marine Life” and “Space Debris and Environmental Impact”. The first topic addresses ocean noise pollution and how we can prevent it and help wildlife, while the second topic addresses how space debris affecting the environment can be prevented. No matter which topic you choose to debate this weekend, we look forward to listening to your creative ideas and solutions.

This weekend, we are looking for delegates who are diplomatic leaders who have creative ideas and are strong speakers. A good delegate should possess a friendly and diplomatic personality, while also demonstrating a flair for creativity and enjoyment. While the committee is a place of debate, it is of utmost importance to be considerate and respectful of other delegates. We hope that each and every one of you step out of your comfort zone this weekend, whether it be through giving speeches without notepads or branching out more in unmods. Most importantly, don’t give up at any point in committee–one mess-up is not the end and we as your chairs understand that committee can be nerve-wracking. No matter whether this is your first conference or last, we truly hope that this TechMUN will be one for every one of you to remember. If you have any questions, don't hesitate to email uneptechmun2024@gmail.com**.**

Jia Mody & Claire Guo

Co-Chairs, United Nations Environmental Programme (UNEP)

Topic A: Ocean Noise Pollution and its Impact on Marine Life

Introduction:

The noise from machines and human activity in the ocean is referred to as ocean pollution. These sounds can interrupt marine wildlife, as many species rely on sound for survival. A number of studies have shown that the effects of anthropogenic sound on marine organisms can range from no influence to immediate death depending on the differences in the intensity and frequency of the noise and the distance from the noise source. Ships, seismic surveys, explosions, construction, and sonar devices have made the once peaceful ocean environment loud and chaotic, which is damaging for marine wildlife. Sound travels much faster in liquid than air, which makes this issue even more pressing. This pollution can prevent animals from listening for prey or predator, disrupting the marine and human food chain. In fact, recent studies have shown decreased species diversity in whales and dolphins due to seismic noise. Furthermore, these sound polluted ecosystems can cause populations to move away, which can lead to overcrowding and further food chain damage. Studies have shown that at least 55 species of fish have started migrating to other areas due to sound pollution. Moreover, noise pollution can harm the reproduction systems of ocean mammals, such as dolphins. This is due to the hindrance of communication between the members of the species, leading to a decline in population. Some causes of noise pollution are cargo ships, sonar, seismic testing, drilling, pile drivers, recreational holiday ships, and more. While ecologists have attempted to combat noise pollution before, a problem arises during the discussion that ships, drilling, and other noise pollution causes are necessities for human life to thrive. Based on frequency and intensity characteristics, anthropogenic noise can be categorized into two main types: high-intensity impulsive noise and low-frequency stationary noise. High-intensity noise can be produced by

pile driving, underwater blasting, seismic exploration and active sonar application. Nowadays, pile driving, a construction activity, is predominantly found nearshore where the construction of bridges, ports, wind farms and other buildings occurs. Seismic exploration devices, mainly air guns, are used all over the world for undersea geological surveys and geophysical studies such as oil and gas exploration and seabed mapping. Similarly, sonar generating noise at various intensities is widely used not only by navies but also by commercial ships, the fishing industry, and marine research organizations. Low-frequency stationary noise can be generated by various ships and vessels. Although the number of fishing vessels has not increased much since the 1960s, there are still about 1.2 million vessels in use. In addition, the number of recreational boats has increased rapidly in coastal areas. Another growing source of marine low-frequency stationary noise is the proliferation of ocean going freighters that transport large cargoes as a critical link for maintaining global commerce. The number of large cargo ships has steadily increased by 8%–14% in the first decade of the 21st century.

Current Situation:

As technology advances, ocean noise pollution is worsening. In a study in 2015, more than 50% of fish species in the Atlantic Ocean were proven to be harmed by ocean noise pollution, whereas this number was only 39.7% in 2005. Since up to 90% of internationally traded goods are now transported by sea, ocean noise pollution in many marine areas has doubled every decade since the 1960s. In European waters, noise levels even doubled within just 5 years between 2014 and 2019. Furthermore, the stress exhibited on marine animals due to ocean noise pollution has proven detrimental to their reproductive systems. Fin whales stop singing when the noise levels drown them out, causing a lack of mating and therefore, population decline.

Possible Solutions:

Combatting ocean noise pollution will take global effort and cooperation. In order to sustain human life, many drilling and sea based activities are necessary, and it will be difficult to uphold the current standards of life without these activities. On the other hand, seas and drills harm animals, and it is important to be cautious of their habitats and environment as well. Proposing regulations about ship speed and drill times may reduce noise emissions, and establishing national transportation agreements may result in a healthier marine environment. Together, these efforts must combine in order to sustain marine life on our planet and through a collaborative and multi-faceted approach, we believe we can combat the issues of marine noise pollution in our seas.

Questions to Consider:

1. How can we ensure the current standards of human life are upheld while promoting a healthier marine habitat?
2. How can we establish international agreements to minimize sea transportation?
3. How can we propose new systems of military weapon testing and sonar screening in order to prevent noise pollution?
4. How can we reverse the damage already done to our marine population and promote reproduction and a healthier food chain?

Helpful Links:

1. https://www.oceancare.org/en/stories_and_news/ocean-noise-polluters/
2. https://wwf.ca/stories/underwater-noise-pollution/
3. https://earth.org/noise-pollution-in-the-ocean/

Topic 2: Space Debris and Environmental Impact

Introduction:

Space debris, otherwise known as space junk, is considered to be any human-made object in orbit not serving a useful purpose and is typically a result of space vehicles no longer in service. These include nonfunctional/abandoned spacecraft, debris, and fragments from rocket bodies and spacecraft. In addition to derelict human-made objects left in orbit, space debris includes fragments from disintegration, erosion, or collisions as well as liquids expelled from spacecraft. The objects that fit this classification vary greatly in size, from old spacecraft and rockets to micro-debris-like flecks of paint. About 25,000 space debris objects are large enough to be tracked and recorded. However, there are millions of minuscule pieces such as shards produced from "breakup events" that are unaccounted for. Space junk started to accumulate from the launch of Sputnik I in 1957 which created the first piece of human made orbital debris. Since then, the United States Air Force created Project Space Track, a system that tracked artificial space objects domestically and internationally. Additionally, around 2,000 active satellites are orbiting Earth at the moment, yet there are also 3,000 dead ones littering space. Furthermore, there are around 34,000 pieces of space junk bigger than 10 centimeters in size and millions of smaller pieces all in space around Earth. Space junk enters space as humans launch objects from Earth, and it stays there until it reenters the atmosphere. Some objects in lower orbits of a few hundred kilometers can return quickly to Earth and often re-enter and burn up in the atmosphere after a few years. However, debris or satellites left at higher altitudes of 36,000 kilometers can continue to circle Earth for hundreds or even thousands of years.

Relevant Issues:

Solving this issue is critical. After all, the effects of space debris on Earth's environment are devastating due to its release of compositional chemicals during re-entry into the atmosphere. The increasing amount of space debris enhances the probability of collisions with different satellites and spacecraft, potentially creating more debris in an effect known as the Kessler Syndrome. This scenario could further escalate the space debris problem, leading to even more environmental damage both in space and on Earth as larger amounts of debris re-enter the atmosphere. Additionally, when space debris re-enters Earth's atmosphere, it often burns up, releasing a mixture of gasses and particles. Some of these materials come from the propellant and other hazardous substances used in spacecraft and satellites. These chemicals can contribute to atmospheric pollution leading to detrimental effects on the environment. The accumulation of space debris also threatens the long-term sustainability of human activities in space. As the debris field grows, it becomes increasingly challenging to find safe orbits for satellites and other space missions, which could limit future scientific research, commercial ventures, and security operations in space.

Possible Solutions:

Tackling space debris effectively requires global cooperation, technology, and regulations. Possible solutions include deploying technology to remove debris and new satellite designs. Establishing international agreements to manage space traffic and prevent debris creation is also vital. Enhancing tracking systems will help avoid collisions, and developing new, durable materials for spacecraft can reduce debris generation. These efforts must be combined with sustainable space practices to ensure the long-term safety and viability of space activities.

Through a collaborative and multi-pronged approach, we can address the space debris challenge and protect both space operations and the Earth's environment.

Questions to Consider:

1. How can countries with spacefaring capabilities be encouraged or compelled to adhere to guidelines and agreements aimed at reducing space debris?
2. How can the design and manufacturing of satellites and other space vehicles be improved to minimize the creation of debris?
3. How can space missions be planned and executed with sustainability in mind, ensuring minimal environmental impact both in space and on Earth?

Helpful Links:

1. https://evreka.co/blog/from-earth-to-space-waste/#:~:text=Effects%20of%20space%20debris%20on,space%20exploration%20and%20future%20generations.
2. https://www.weforum.org/agenda/2022/07/environmental-impact-space-debris-how-to-solve-it/
3. https://interconnectedrisks.org/tipping-points/space-debris

Works Cited

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