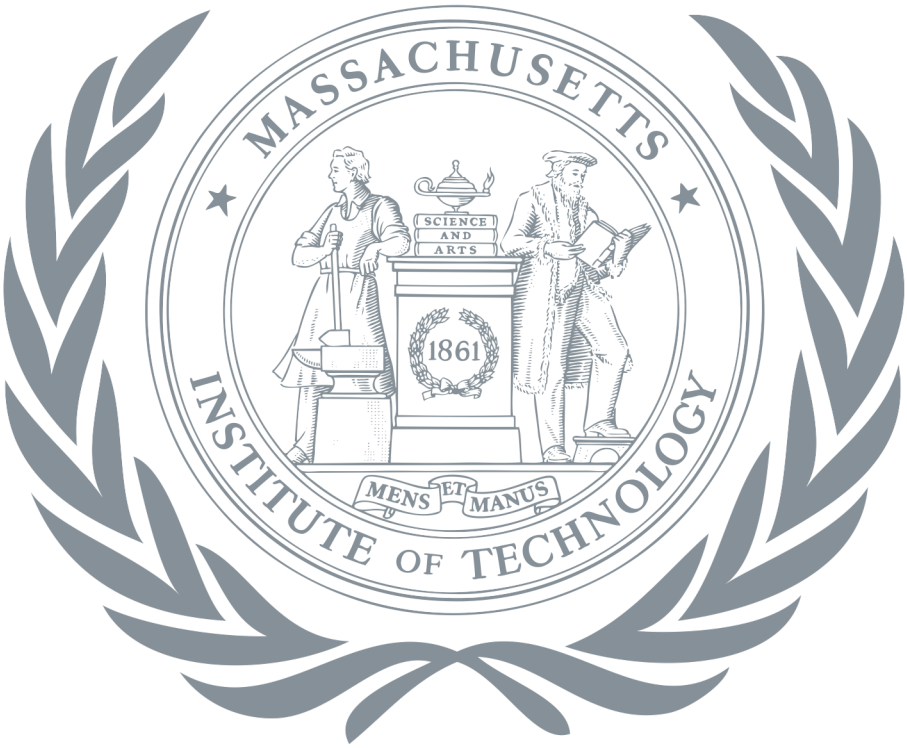

UNEP

MITMUNC 2014

Hi everyone!

We are excited to be chairs of this year's United Nations Environment Programme (UNEP) committee at MITMUNC 2014! Andrew and I are both freshmen at MIT, and are very excited to chair for our first conference with MITMUNC.

My name is Pragya Tooteja, I am a first year student at MIT pursuing Chemical Engineering. I'm passionate about the environment, and am interested also in energy use. I have been heavily involved in Model UN in the past, and have been a delegate in different committees including the UNEP and the HRC. This is my first time chairing a conference, so I am really eager to participate in MUN from the other side as a chair.

Please also welcome my co-chair, Andrew Xia. Andrew is also a freshman at MIT and he anticipates studying mathematics. Outside of MUN, Andrew is also involved with tutoring kids and being with friends. He is also passionate about the environment.

It'll definitely be a fun weekend for all of us, and be sure to stay warm when you arrive! Feel free to email us anytime at unep2014@mitmunc.org.

Pragya Tooteja

&

Andrew Xia

Assessing Long Term Environmental Consequences to Ocean Acidification

In recent years, the increase of carbon dioxide from industrial human activities has resulted in global warming and climate change. However, a lesser known fact is that the increase in carbon dioxide has also altered our oceans, causing our oceans to change in chemical composition and become more acidic. This change has caused a disruption in the ecosystem for species in the ocean, and subsequently human activities such as fishing and tourism have been adversely affected. In the long term, with unregulated human activity, the pH level of oceans could go up by 150 percent by the end of the 21st century. Therefore, it is imperative for us to act now and find solutions to impede the further acidification of oceans.

The U.N. Environmental Program (UNEP) has taken a stance in the regulation of ocean acidification and has recommended nations around the world to partake in many actions. In a general sense, the actions that UNEP has recommended can be grouped in three main points: research in the effects on species, research in the effects on human coastal communities, and research in geological engineering that can help solve or alleviate this problem. The UNEP has recommended countries to discover which species are most flexible to change and thus would be more likely to survive in altered conditions. It is also important to determine how coastal communities would be affected by a dramatic reduction in income from fishing, and how this change would affect the food security and economy of the cities. One radical approach would be to explore options of engineering artificial reefs to provide human-regulated habitats for the protection and farming of fish.

Effects on Fishing and Fishing Communities

One billion people around the world rely on fish for their primary source of protein. With a disruption to the ocean's ecosystem, people are risking starvation for thousands of communities of people around the world. Furthermore, three billion people will consume fish as part of their source for animal protein.

Approximately 80 percent of fish catches occur in only 105 of the oceans in the world, and these regions–including estuaries and continental shelves–are especially vulnerable to ocean acidification.

Solutions for Ocean Acidification

Currently, approximately 25 percent of the world's carbon emissions are being absorbed into oceans, where the carbon dioxide is converted into carbonic acid. With the lowering of carbon concentrations, many species are thus unable to find carbonate ions to build their skeleton, or for coral reefs or shells to be created. Currently, carbonate ions levels are at the lowest in the past 800,000 years, and if the rate of ocean acidification is sustained, by 2032 the Arctic Ocean will be under-saturated with critical minerals, and by 2050 the Southern Ocean will have suffered significant disruptions that will directly affect the marine food web.

Effect on Biodiversity

In a UNEP report from December 2010, there has been substantial evidence showing that certain species are having more trouble surviving in their once-normal ecosystem. For example, because of the increased acidity in the ocean, species such as coral and shellfish are no longer able to find resources to form their skeletons, thus making survival increasingly more difficult. This in turn causes a decrease in the population of crabs and mussels, which directly affects the diets and economies of coastal communities around the world. Tropical reefs around the planet are the primary ecosystem for one fourth of all known marine species, and these regions are adversely affected with an increase in acidity.

Country Blocs

Coastal and small island developing nations

Coastal and small island developing nations are the most vulnerable to food security risks caused by ocean acidification and climate change combined. For millions of small-time fishermen, wild-caught seafood serve as both a source of food and income. Additionally, many of these nations have created marine tourism jobs from endangered ocean biodiversity. The list of the nations ranked most vulnerable to food security risks, according to an Ocean report, caused by a combination of ocean acidification and climate changes is as follows: Comoros, Togo, Cook Islands, Kiribati, Eritrea, Mozambique, Madagascar, Pakistan, Sierra Leone, Thailand, Algeria, Guyana, Haiti, Libya, Croatia, among others.

United States

Although there has been significant scientific concern since the 1970s, the U.S. Congress has only begun to act on calls for a national program on ocean acidification in the past several years. Oyster farms in the U.S. have already reported massive die-offs due to ocean pH. Additionally, ocean acidification is projected to reduce fisheries catch in the Northeastern U.S. by 20 to 30 percent. The first request for action specifically concerning ocean acidification appeared on a marine fisheries management law in 2006. The Federal Ocean Acidification Research and Monitoring (FOARAM) Act was finally signed into law in 2009 and called for further research by U.S. agencies specifically concerning ocean acidification.

People's Republic of China, Republic of Korea, Japan

China has expressed concern that ocean acidification will cause undue harm on the marine ecosystem, since the direct affect ocean acidification will have on coral reefs, mollusks, and crustaceans will have a noticeably negative impact on fish populations. Some reports show that China will be among the top 50 nations whose food security will be most threatened by a combination of climate change and ocean acidification. As a result, China has begun to support research on ocean acidification since 2006. Similarly, both South Korea and Japan have research programs to study elevated carbon dioxide levels in the ocean. Japan also supports modeling efforts to help predict future ocean conditions.

European Union (E.U.)

The European Council funded the first multinational effort to study ocean acidification and its consequences. This project has mostly studies the effects of ocean acidification in the Mediterranean. Additionally, Germany and the U.K. both have additional research programs studying the biological impacts and the Arctic and Southern oceans, respectively.

Australia

Australia supports ocean acidification research throughout the Southern Ocean to the Great Barrier Reef and into Papua New Guinea. Additionally, data from the Integrated Marine Observing System (IMOS), which consists of observing equipment deployed throughout Australian waters, is made free and openly available via the Internet.

Conclusion

There are many reasons why ocean acidification is a major concern for nations around the world. If the acidification of oceans continue at its present rate, numerous species will face threats of extinction and there will be direct consequences to human diet and the thriving of certain coastal communities. With the current pollution of oceans, ecosystems are being destroyed, fishing, food security, and the economies of countries around the world could suffer.

While the most direct solution to limiting ocean acidification would be to make a significant cut to the burning of fossil fuels and carbon dioxide output, in the near future this outcome is rather unlikely. It is up to you, as a delegation, to devise a solution that is acceptable for the nations around the world to follow, that will ultimately regulate the world's ocean acidification rates, and save the ecosystems of oceans around the world.

Further Reading

Ocean-Based Food Security Threatened in a High CO_2 World:
http://oceana.org/sites/default/files/reports/Ocean-Based_Food_Security_Threatened_in_a_High_CO2_World.pdf
Environmental Consequences of Ocean Acidification: A Threat to Food Security:
http://www.unep.org/dewa/Portals/67/pdf/Ocean_Acidification.pdf
Ocean Acidification Issue Paper:
http://www.unep.org/delc/Portals/119/issuepapers/FINALISSUEPAPERN07.pdf
Impacts of Ocean Acidification:
http://www.esf.org/fileadmin/Public_documents/Publications/SPB37_OceanAcidification.pdf
Updating what we know about ocean acidification and key global challenges:
http://www.iaea.org/ocean-acidification/download/11_Dissemination/OA%20The%20knowledge%20base%202012/OA.2012.English.hires.pdf

Protecting Arctic biodiversity from climate change, long-range pollution, and invasive species

The Arctic region has been one of the longest-standing and intact ecosystems on the planet. Home to seven of the ten largest wilderness areas of the world, and also home to the largest natural forests in the world, the Arctic is an area which has immense biodiversity and natural resources, making it a region of interest to not only the countries geographically near the Arctic region, but to the whole world. Indeed, in 2002, the Arctic supplied 10 percent of the world's fishing catch. The Arctic is also home to many natural resources, for instance approximately 3.2 percent of the world's gold production is from the Arctic, and Arctic Russia produces 21 percent of the world's global gem-quality diamonds.

The Arctic has a significant contribution towards global biodiversity. While it has relatively fewer species than regions such as the rainforests, the Arctic region is recognized for its genetic diversity, containing species that are specifically adapted towards surviving in extreme conditions such as the Arctic.

Although the exact definition of the Arctic is under debate, the central feature of the Arctic region is that the Arctic Ocean, the smallest and shallowest of the five oceans, borders the U.S., Canada, Russia, Norway, and Greenland. The Arctic Ocean's surface is covered by a perennial drifting layer of ice which is on average three meters thick. The amount of coverage of the ice depends on the season. In the summer, the permanent ice-pack is surrounded by 'open seas', but in the winter the ice layer doubles in size and "extends to cover the encircling landmasses". Apart from the Arctic Ocean, the Arctic region also consists of parts of Canada, Russia, Alaska (part of the U.S.), Greenland (part of Denmark), Norway, Sweden, Finland, and Iceland.

In recent years, the Arctic region has undergone significant changes. Due to climate change, contaminants, and invasive species, the biodiversity in the Arctic is starting to decline. Indeed, the Arctic Species Trend Index shows a 10 percent decline in terrestrial vertebrate populations. While the majority of species are stable or increasing, some species which are important to humans are declining in population, such as reindeer. There have also been signs of decline in species which are dependent on sea ice, because of the melting of the ice caps. Because many species in the Arctic migrate to the Arctic from other places, and also because of the global nature of many of the causes of the loss of biodiversity such as marine pollution and climate change, the problem of the loss of Arctic biodiversity has to be addressed on a global scale.

The UNEP and the Arctic

Because of the global importance of the Arctic, several measures have been taken in the past to protect Arctic biodiversity. Most multilateral environmental agreements (MEAs) have been adopted since the United Nations Conference on the Human Environment (Stockholm conference) in 1972.

Several multilateral environmental agreements have been made in the past which

are relevant to preserving biodiversity in the Arctic. There are Arctic-specific MEAs, such as the Agreement on the Conservation of Polar Bears and the Agreement between the Governments of the United States and Canada on the Conservation of the Porcupine Caribou Herd. Some important conventions in the context of the preservation of Arctic Biodiversity include: the Ramsar Convention on Wetlands, a treaty which promotes the sustainable use of wetlands in territories; the Convention on Biological Diversity, an agreement between nations to take steps to preserve biodiversity. The Convention on Biological Diversity has set specific targets to achieve the goal of preserving biodiversity, such as:

- At least halve, and where feasible, bring close to zero the rate of loss of natural habitats, including forests.
- Establish a conservation target of 17 percent of terrestrial and inland water areas and 10 percent of marine and coastal areas
- Restore at least 15 percent of degraded areas through conservation and restoration activities

The Convention on Biological Diversity also consists of the Aichi Biodiversity Targets which are:

- Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
- Reduce the direct pressures on biodiversity and promote sustainable use
- To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
- Enhance the benefits to all from biodiversity and ecosystem services
- Enhance implementation through participatory planning, knowledge management and capacity building

Other MEAs include the UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage (WHC); the Convention on Migratory Species (CMS) and its associated agreements such as the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA); and, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

In addition to MEAs specifically geared to biodiversity, there are other conventions which are relevant towards protecting Arctic Biodiversity, such as the Vienna Convention on the Protection of the Ozone Layer, and the Kyoto Protocol.

Key Factors affecting Biodiversity

Some of the key factors affecting biodiversity in the Arctic are climate change, industrial development on land and sea, resource depletion, water and air pollution.

Climate change is a key factor in affecting biodiversity in the Arctic. Because of the melting of the polar ice caps, the populations of ice-dependent species have declined most notably the polar bear and seals. For instance, the population of seals has decreased by 75 percent in only the past 55 years. Similarly, the population of polar bears is so low, estimated at 20,000 polar bears, that the polar bear has been classified as vulnerable by the IUCN Red List. The melting of the ice caps and a warmer arctic is also predicted to increase the prevalence of diseases in the Arctic, a factor which will affect all levels of species in the Arctic.

Furthermore, industrial development on land and sea, is also a factor affecting biodiversity. For instance, the number of wild reindeer and caribou in the Arctic are falling because of industrial development. Industrial development creates 'avoidance zones', areas where reindeer and caribou do not venture near developments. The creation of 'avoidance zones' reduces the land available to reindeer; which causes the population of reindeer to decline. Additionally, the fragmentation of forests and resource depletion such as forestry (the habitat of reindeer) makes it easier for predators and hunters to gain access to reindeer, which also endangers the population of reindeer.

Additionally, water and air pollution contribute to the loss of biodiversity. The populations of alcids have been negatively affected especially by oil spills. The birds are particularly sensitive to even small oil spills. This has caused concern about increased tourist activity in the Arctic and particularly the increased number of cruise ships, because this increases their risk of grounding and spilling oil into the sea. Overfishing has also negatively affected the populations of predators which rely on fish for their sustenance. For instance, the number of alcids which feed on the Barents Sea capelin has decreased sharply, due to overfishing.

Furthermore, the introduction of invasive species poses a threat to Arctic biodiversity. The Red King crab for instance, an introduced carnivorous crab which preys on many organisms living on the surface of the seabed, is thought to pose a risk to biodiversity. Although much research has not been conducted into this matter, the Red King Crab is thought to also facilitate the spread of blood parasites in fish. It is difficult to draw any conclusions because of the sparse evidence and research that exists about Arctic species.

Country Blocs/Positions

Conference of Arctic Parliamentarians (CPAR)

The Conference of Arctic Parliamentarians is a parliamentary body which consists of delegations from Arctic states (Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and the U.S.), along with the European Parliament. It also includes Permanent Participants who represent the Indigenous Peoples of the Arctic, as well as observers. The Conference of Arctic Parliamentarians works together to achieve diplomacy amongst Arctic states upon several issues. One of the major products of the CPAR was the formation of the Arctic Council.

Arctic Council

The Arctic Council consists of delegates from the Canada, the Kingdom of Denmark, Finland, Iceland, Norway, Russian Federation, Sweden, and the United States of America. According to a recent statement made by Minister Aglukkaq on behalf of Canada and the Arctic Council, the Arctic Council recognizes that "climate change is the most serious threat to Arctic biodiversity and ecosystems". The role of the Arctic council is to play a "leadership role in highlighting the environmental, cultural, and societal implications of climate change for Arctic inhabitants, with a particular emphasis on Indigenous Peoples". In the first decade of its founding, the Arctic council was very much involved with combating pollution,

especially the high levels of environmentally hazardous substances and heavy metals in the Arctic. Now the Arctic Council is also focusing on combating climate change.

Canada

Over two-fifths of Canada's landmass is in the Arctic, totaling an area of 3.5 million square kilometers. 111,700 Canadians live in Canada's 'North'. In 2009, the Government of Canada has launched the Northern Strategy and the Statement on Canada's Arctic Foreign Policy in 2010 to respond to the challenges and opportunities for the Arctic region. Canada is "taking action to advance its interests both domestically and internationally and to help unlock the North's true potential." This includes exercising sovereignty, promoting economic and social development, protecting environmental heritage, and improving Northern governance.

Canada is heavily involved in the Arctic council, co-chairing the "Recommended Best Practices in the Prevention of Oil Spills in the Marine Environment" group, along with the "Circumpolar Biodiversity Monitoring Program" and the "Conservation of Arctic Flora and Fauna" working group. Canada also has three of the six indigenous groups of the Arctic who are represented on the council. Additionally, Canada is heavily involved in Arctic research and was one of the major contributors to the International Polar Year.

Finland

As an Arctic state, Finland also has a vested interest in the wellbeing of the Arctic. Finland has also been a leader in Arctic research, and 'arctic-related issues can be found in the teaching and research programs of many institutions of higher education in Finland'. Finnish industry also has experience and expertise in developing arctic infrastructure, arctic environmental technology, and navigation in ice-covered waters. Furthermore Finland is home to the Sami, the only indigenous people within the European Union, who also serve as permanent participants of the Arctic Council. Finland hopes that the work of the Arctic council will "contribute to the improvement of the living conditions of the Sami and to their full integration into the sustainable development of the Arctic".

Norway

Due to the warming effect of the Gulf stream because of climate change, Northern Norway has been made much more hospitable than it was before. Norway contains the city Tromsø, the largest city in North Norway and is called the "Gateway to the Arctic". It has the world's most northernmost university, and the FRAM High North Research Centre for Climate and Environment, where 500 scientists research about fields of technology, natural sciences, and social sciences.

Traditionally inhabitants of Norway relied on fishing and livestock husbandry for their livelihoods. Norway is also home to the Sami people of the Arctic. Their most concentrated settlements are in North Norway. Since 1989, the Sami have held representation in the Norwegian government through an elected assembly.

Norway aims to "maintain the Arctic as a peaceful region of cooperation and sustainable resource management". In order to do so, Norway advocates that the Arctic

council has to take decisions "more of a binding nature", and that it should broaden its discussions by "including relevant observers".

Russian Federation

About one-fifth of Russia's landmass is located North of the Arctic Circle. Roughly 2 million of 4 million inhabitants of the Arctic live in Russia. Russia aims for the sustainable development of the Arctic and to protect the ecosystem of the Arctic.

Sweden

Sweden is heavily involved in climate-related research in the Arctic. It is noted for its long measurement series, which even go back to one hundred years, which have helped Sweden to contribute to a better global understanding of climate change. According to its official statement "Sweden promotes economically, socially and environmentally sustainable development throughout the Arctic region. Sweden also works to ensure that the Arctic remains a region where security policy tensions are low, and for these objectives sees a need of a strengthened Arctic Council."

United States

The U.S. became an Arctic state when it purchased Alaska from Russia in 1867. The United States also aims for the sustainable development of the Arctic. In 2010, it promoted the human health as a major theme of its first chairmanship by launching the International Circumpolar Surveillance, a disease surveillance program led by the US Centers for Disease Control and Prevention. The US also initiated the Arctic Climate Impact Assessment, the first comprehensive scientific assessment of the impacts of climate change on the Arctic.

Conclusions

There are many concerns that need to be addressed in order to protect Arctic biodiversity better. Amongst all of the stressors on Arctic biodiversity, climate change is "emerging as the most significant stressor of Arctic biodiversity". Global warming is likely to impact arctic biodiversity from secondary sources, such as the release of POPs from melting snow, ice, and permafrost, invasive species, and the extraction of oil and gas and other resources. This could threaten the balance of the Arctic ecosystem.

Many MEAs do not address ways to combat climate change. Existing MEAs only apply to local Arctic states, and may be effective if fully implemented against conventional threats, but do not help against climate change. This is because the majority of human contributions to greenhouse gases come from outside of the Arctic, so the issue of climate change has to be addressed on a global scale.

Hence, MEAs which focus primarily on activities in the Arctic might not be the effective to tackle the underlying cause of climate change nor to address the impact on Arctic biodiversity. The MEAs should be global in focus.

There is also a need to target specific Arctic species and to designate specific conservation areas. Arctic migratory wildlife cannot be protected without some type of collaboration between the Arctic and the state which hosts the species in its migration. While global conventions on migratory species already

exist, specific agreements are needed to ensure protection of certain migratory species. The Convention on Migratory Species provides a useful framework in this regard. However, the US, Canada, and Russia have not signed the Convention on Migratory Species or its Agreements.

Furthermore, more Arctic biodiversity data is needed to take better action to protect Arctic biodiversity. Finally, a holistic approach is required. Many MEAs do not address the root causes of the loss of Arctic biodiversity such as global warming.

For more information:
http://www.arctic-council.org/index.php/en/
http://www.unep.org/
http://www.cms.int/
http://www.arcticbiodiversity.is/

Works Cited

Johensen, K.I. "Protecting Arctic Biodiversity." United Nations Environment Programme. N.p., n.d. Web. 1 Dec. 2013. <http://www.unep.org/dewa/Portals/67/pdf/arcticMEAreport_screen.pdf>.
"Arctic Council." Arctic Council. N.p., n.d. Web. 28 Nov. 2013. <http://www.arctic-council.org/index.php/en/>.