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Wave of change

A co-created blog post about minimizing and addressing the impacts of ocean acidification at all levels, through enhanced scientific and legal knowledge

Published on 25 March 2024

Abstract

The purpose of this blog post is to first present the undeniable reality of our oceans and the effects that acidification has had on the waters and marine and terrestrial beings.



In the introduction of this project, we have been asked to tackle the UN SDG 14.3, which revolves around the following desired goal: to *"minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels"*.



In the methodology we present the tools we have used to enrich our study of the oceans as well as the “ingredients” that we have employed in order to reach the final “cake”, which serves as a motivational and awareness toolkit of action.

The intention is to deliver it to all audiences, but especially to academic teachers at schools and high school and university professors, to educate their students in an original way, as a starting point in their courses, by adapting their academic knowledge and background to the students' academic level.

Keywords

- **SDGs**
- **Climate action**
- **Marine life**
- **Ocean degradation and acidification**
- **Sustainable development**



One-pager



Hello there! We are team 10 from the course of Administrative Law. We have been assigned a task related to helping marine life and saving it and ourselves from ocean acidification. But how can we do that? We are just students. How are we supposed to save everyone?

Our one-pager was not created randomly

✦ The avatars are our fictional representations, and each character is associated with two pictures fitted in the letters above.

✦ The pictures symbolize some of our connections and experiences with the ocean.

✦ Also, our project and one-pager have been given the title "Wave of Change", that is to connote the power of current young generations of driving positive change through ocean action.

What we thought about is this

Ignorance is our greatest enemy, right?

What if we produce, record, and edit a brand-new song?

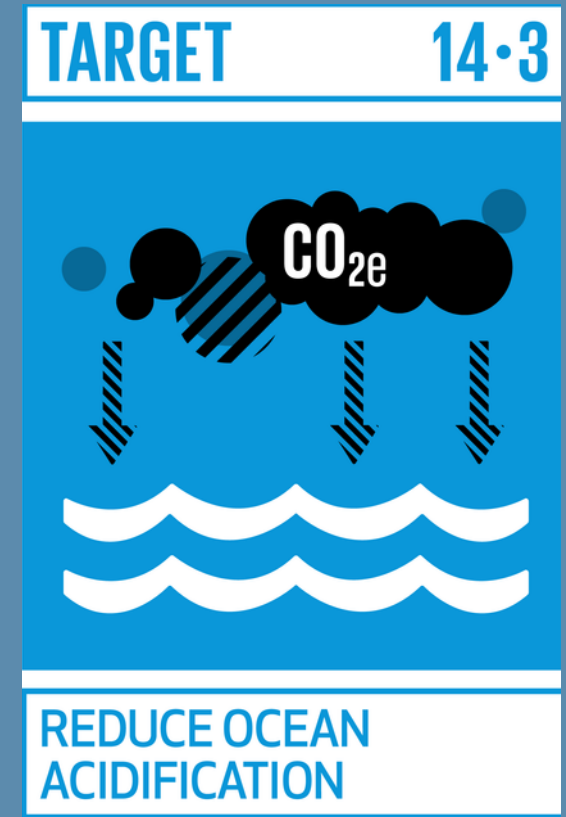
A song that includes ocean awareness, and involves its listeners into taking action by empowering them with this knowledge.

Anyone who listens to it can take action, from children to teachers to adults and communities.

Inspiration is essential, but motivation and education are key factors.

Our focus

Protecting Communities and Livelihoods from the Threat of a Changing Ocean by taking action



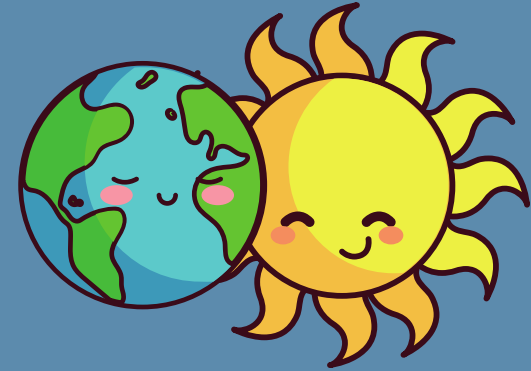
Introduction



Today, we are witnessing phenomena that are devastating our world and risking extinction in the near future if we do not intervene. However, many are still skeptical about the existence of climate change or its severity. For this reason it is first and foremost important to establish concretely whether what we are experiencing is real or simply exaggerated by social media.

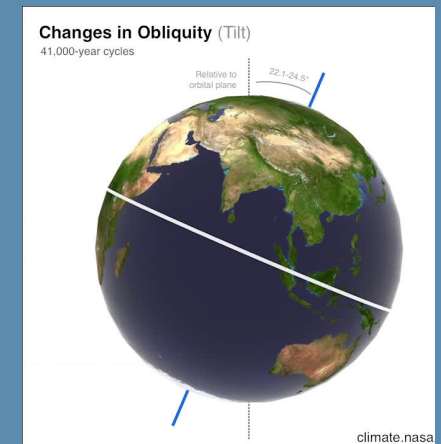
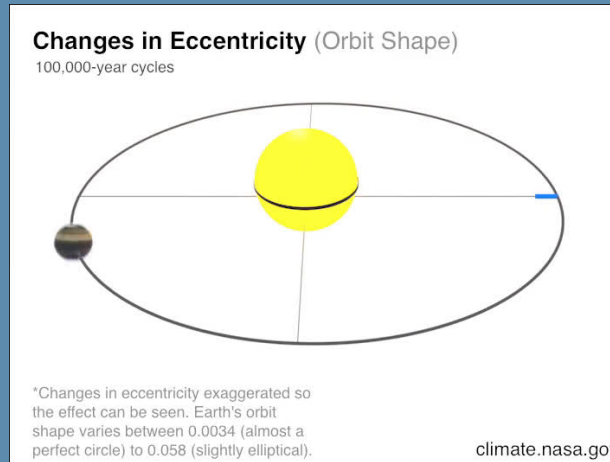
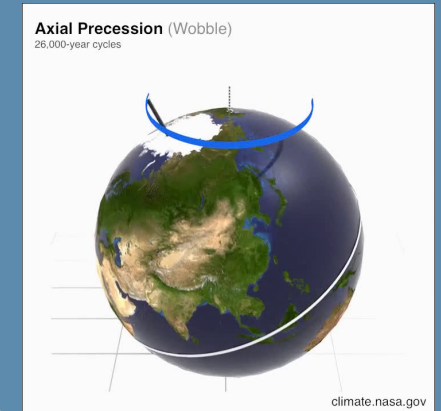
In giving us an answer, the Serbian scientist Milutin Milankovitch comes to our aid. Through his studies, he provides us evidence to say that climate change is not something subjective but rather something real and something that has been always present.

The scientist describes how changes in the Earth's rotation relative to the sun result in a constant and significant alteration of the Earth's climate. These variations, known as Milankovitch cycles, play a crucial role in triggering the beginning and conclusion of glaciation periods since they cause fluctuations in incoming solar radiation



The Milankovitch cycles include three key orbital movements: eccentricity, obliquity, precession (NASA, 2024)

(NASA, 2024)

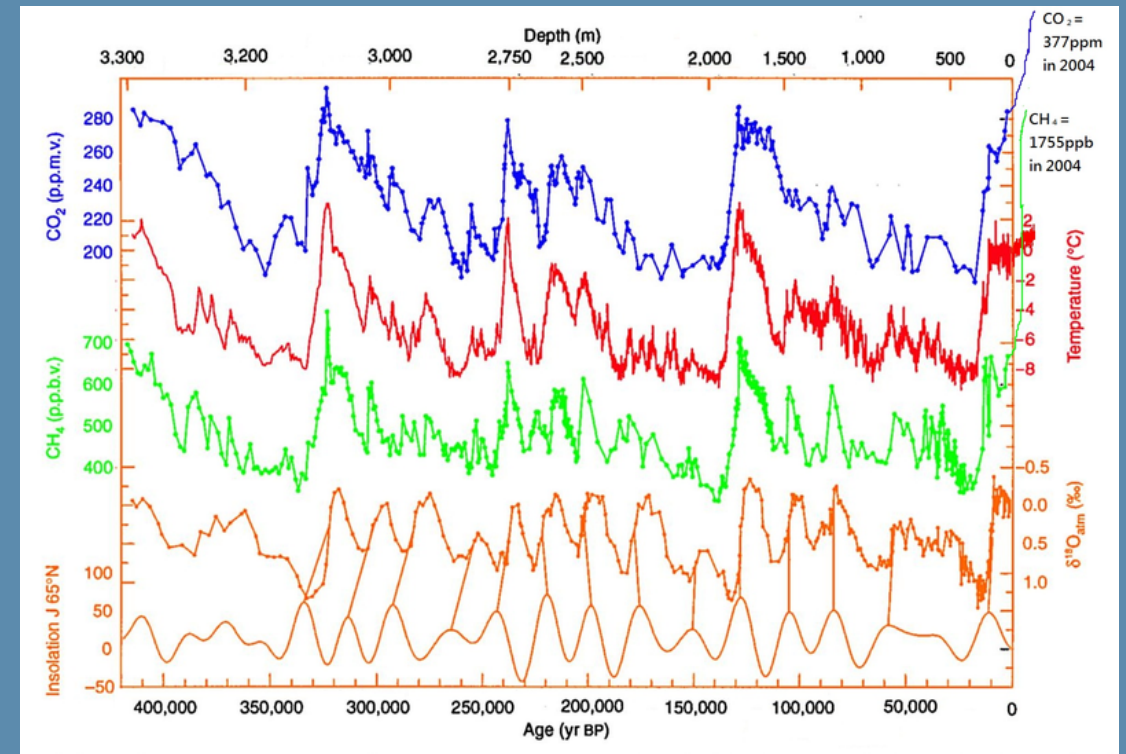




Milankovitch theories have found confirmation in reality through the analysis of data obtained from ice core extraction in Antarctica, a process that allows us to gain insights into the past by examining ice cores.

Ice sheets and glaciers near Earth's poles form through accumulated snowfall over many years. Each year's snow compresses previous layers, creating glacial ice, that sometimes can be several miles thick.

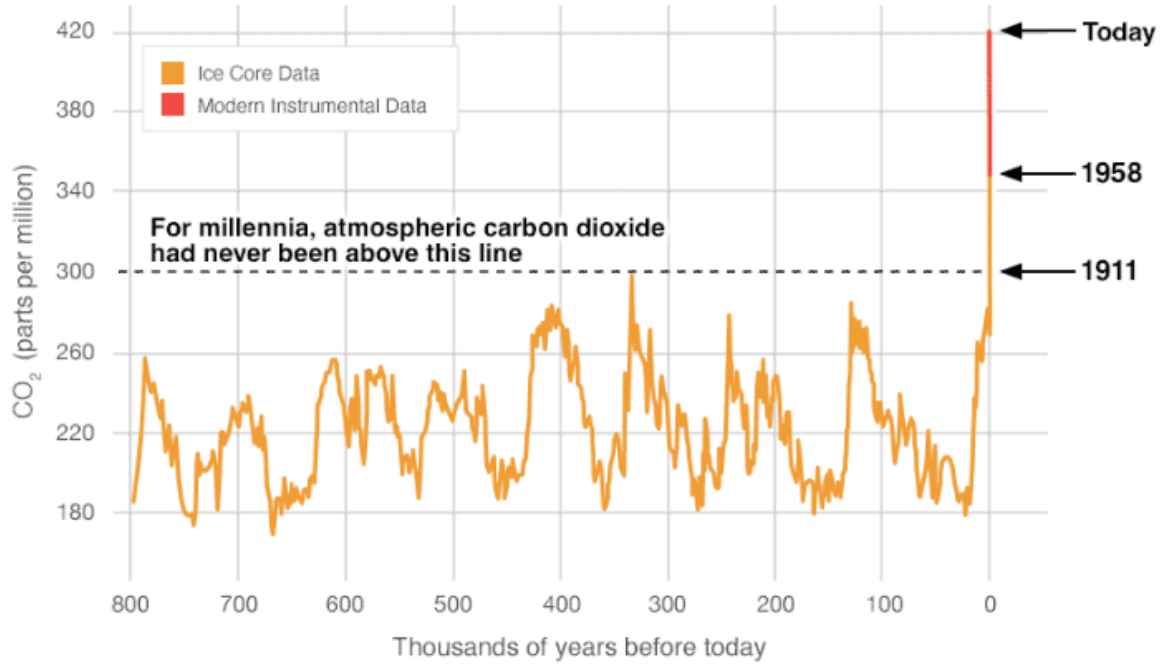
Researchers drill ice cores from these ice sheets to study regional climate variability. Particles trapped in the ice, including aerosols and greenhouse gases like CO₂ and methane, provide physical evidence of past global events, such as volcanic eruptions, or past environmental conditions. By analyzing these levels of greenhouse gases in the atmosphere, scientists can provide us information about the evolution of climate change over time. (NASA 2017)



420,000 years of ice core data from Vostok, Antarctica research station. Current period is at right. We can see how temperatures fluctuate in a constant way validating Milankovitch theories (Bethan Davies (2020))

PROXY (INDIRECT) MEASUREMENTS

Data source: Reconstruction from ice cores.
Credit: NOAA



Nasa (2024). "Carbon Dioxide"

However, In recent decades, along with the natural cycles causing temperature fluctuations, another significant factor impacting our planet has emerged: the rise in atmospheric CO₂ levels given by the burning of fossil fuels

What is CO₂?

CO₂ is a gas that functions similarly to the glass in a greenhouse, trapping heat produced by the sun, which is essential for sustaining Earth's habitat. However, when its concentration becomes excessively high, it leads to a significant rise in global temperatures, resulting in an exacerbation of the climate change. (Natural History Museum, 2024)

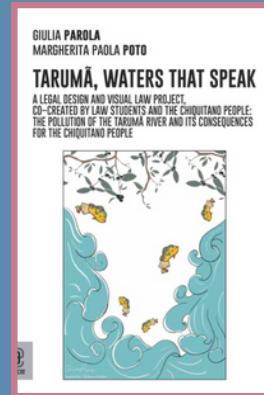
What are fossil fuels?

Fossil fuels originate from the decomposition of ancient plants and animals (such as dinosaurs), and they are located in Earth's crust. These fuels consist of carbon and hydrogen, which can be combusted to produce energy. Examples of fossil fuels include coal, oil, and natural gas. Their combustion releases CO₂ into the atmosphere. (National geographic 2024)

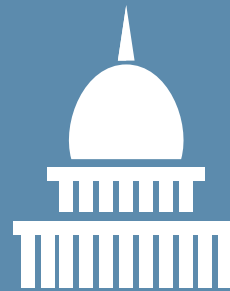
What can we do?

We cannot intervene in physical phenomena like the orbits of our planet, but we can address the impact that humans have on the Earth. Our blog aims to provide the necessary tools for the first step in addressing the problem: awareness. Without knowing what the problem is, how can we solve it? Through various projects, we will educate readers on how climate change is increasingly influencing our world. We will delve deeply into SDG 14.3 and how it is interconnected with SDG 13.

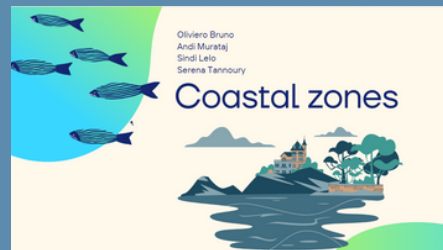
Why is awareness so important? It's a tool...



...to safeguard the most vulnerable



...to ensure that no one can do whatever they want



...to understand what we are going to lose



...to discover how many people are already fighting

[LINK TO PRESENTATIONS](#)



Methodology

Our previous and final projects objectives

Within this section, we want to explain our decision-making process behind the projects we undertook and how initial presentations provided valuable insights on realizing the final project. The group work has been fairly divided among the group members in the various tasks assigned. To begin with, each task in the project has been developed through a group brainstorming aiming at creating ideas to be presented in a realistic and feasible way: target identification, methodology and possible work division based on the strengths and the talents of each member.

1 TARUMA PAPER

The objective was to tell the story and reach all types of audiences by preparing a quick introduction, a visual representation of the book and engage the audience with a cross word game and a board game.

2 PUBLIC PROCUREMENT PRESENTATION

The presentation was mainly focused on involving the broader possible audience by first preparing a one pager where each group member had to explain their connection to the ocean, including some past good and bad experience related to it, a brief introduction to SDGs 13, 14, and 14.3 objectives and significance and to end our work with a song related to the theme.

3 SDG 14.3 SCIENTIFIC PRESENTATION

The presentation aimed to engage the audience by starting with personal connections to the ocean, introducing SDGs 13, 14, and 14.3, and incorporating scientific data and examples of ocean-related initiatives and startups to inform the accompanying song..

4 BLOG POST

Our final creation: a general summary with the purpose of better targeting the need to act, by building awareness and tools highlighting the importance of life under water for everyone.

Methodology-Taruma river

Where did we start?

"On March 1st, 2024, we created the Administrative Law Group 10, and from the outset, we began working efficiently and creatively. Upon downloading the PDF of the book, we immediately decided to divide the work. Since the book was lengthy, each of us was tasked with covering approximately 15 pages each."

We had many ideas in mind, but certainly the one closest to realization, besides the one we implemented, was representing the story through illustrations created using artificial intelligence. However, in the end, we opted for a more personalized product by combining various images, animations, and sound effects on canva.

Contributions (Slide number, Person who made it)



1-2 Lorenzo

4-6 Sindi

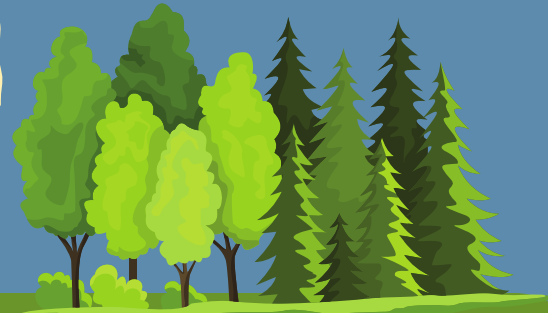
7-9 Andi

11-13 Andrea

14-15 Serena

17-20 Oliviero

22-26 Serena



"The encounter with the river"
created by Andrea through AI

This initial presentation made us realize how crucial it is for people to be aware of things because knowledge can empower populations to defend themselves against the abuses of the more powerful. From this, we decided to focus our project on something that spread knowledge and helps people realize what they should be entitled to.

Methodology-Public procurement + Coastal zones

Public procurement

In this project, we had to prioritize efficiency over creativity since we had just a single day to work on the project. While one part of the team focused on gathering information, the other handled the graphic design and presentation of concepts. Despite opting for a simple presentation style, we aimed for visual impact. That's why, whenever possible, we included numerous images (like flags) and decided to introduce a video towards the end. In addition, we committed to introducing many real-world examples through case studies to demonstrate how practical solutions are the immediate continuation of the process that starts with awareness. This line of work is the one we used for the final project.



Contributions (Slide number,
Person who made it)
1-5 Oliviero
6-10 Serena
11-14 Sindi
Andi, Andrea, Lorenzo
"Information gathering"

Contributions (Slide number,
Person who made it)
1-2 Oliviero
3-4-5 Andi
6-7 Sindi
8-9-10 Serena
Lorenzo "Information
gathering and grammatic
control"

Coastal zones

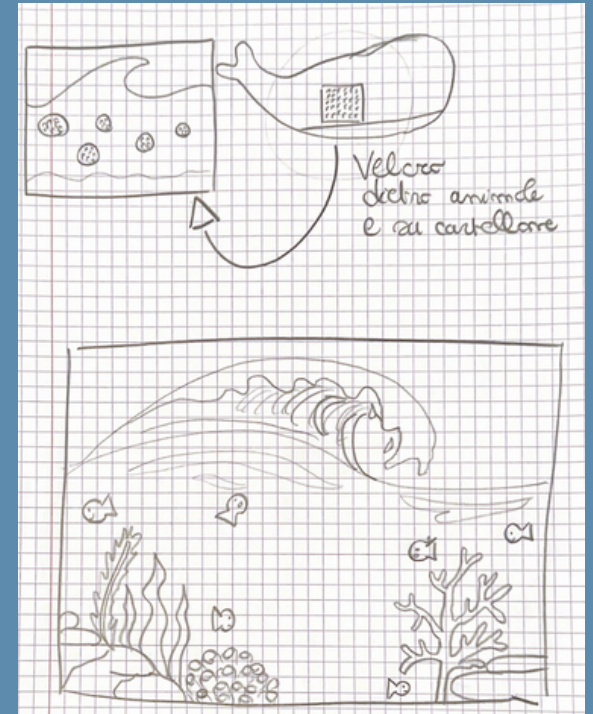
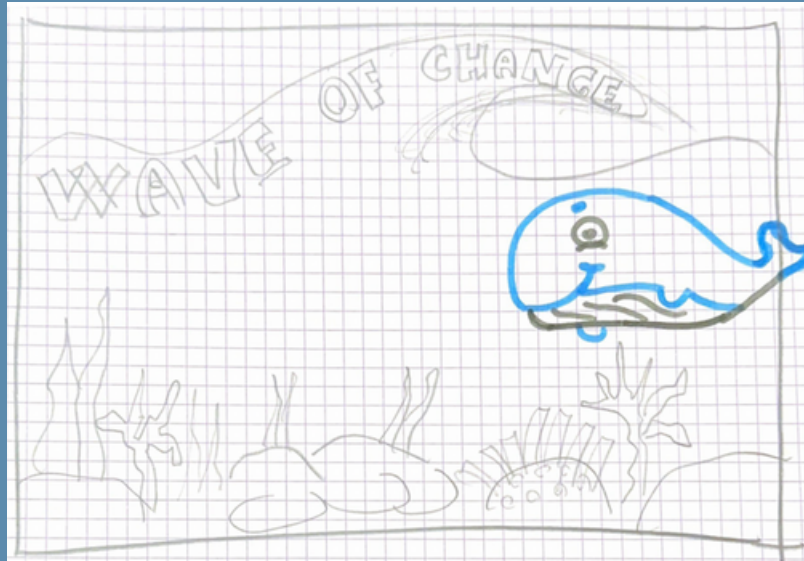
We had many ideas on how to structure the work. The abundance of scientific material and the wide range of topics we could cover led us to have a longer-than-usual brainstorming session. In addition to keeping the presentation highly visual, we opted for a Kahoot to engage the group more actively.

Professor Panieri made us reflect deeply with one of her statements. She said, "People don't worry about what's happening in the ocean because visually, it appears healthy. Looking at any picture of a river, it's unthinkable to say that it hides all sorts of waste inside." This strengthened our belief that it was necessary to let people know about what was really happening in the oceans.

Methodology-Wave of change

Surely was the most interesting project. The one where everyone managed to showcase their potential. From the first days of creating the group, we often questioned how to approach the work. Many already had fantastic ideas like cakes or menus, and we didn't want to fall behind. Over the two weeks, we drafted various ideas, ranging from basing our research on a large one-pager to creating a small theater scene complete with stage costumes, scripts, and sound effects.

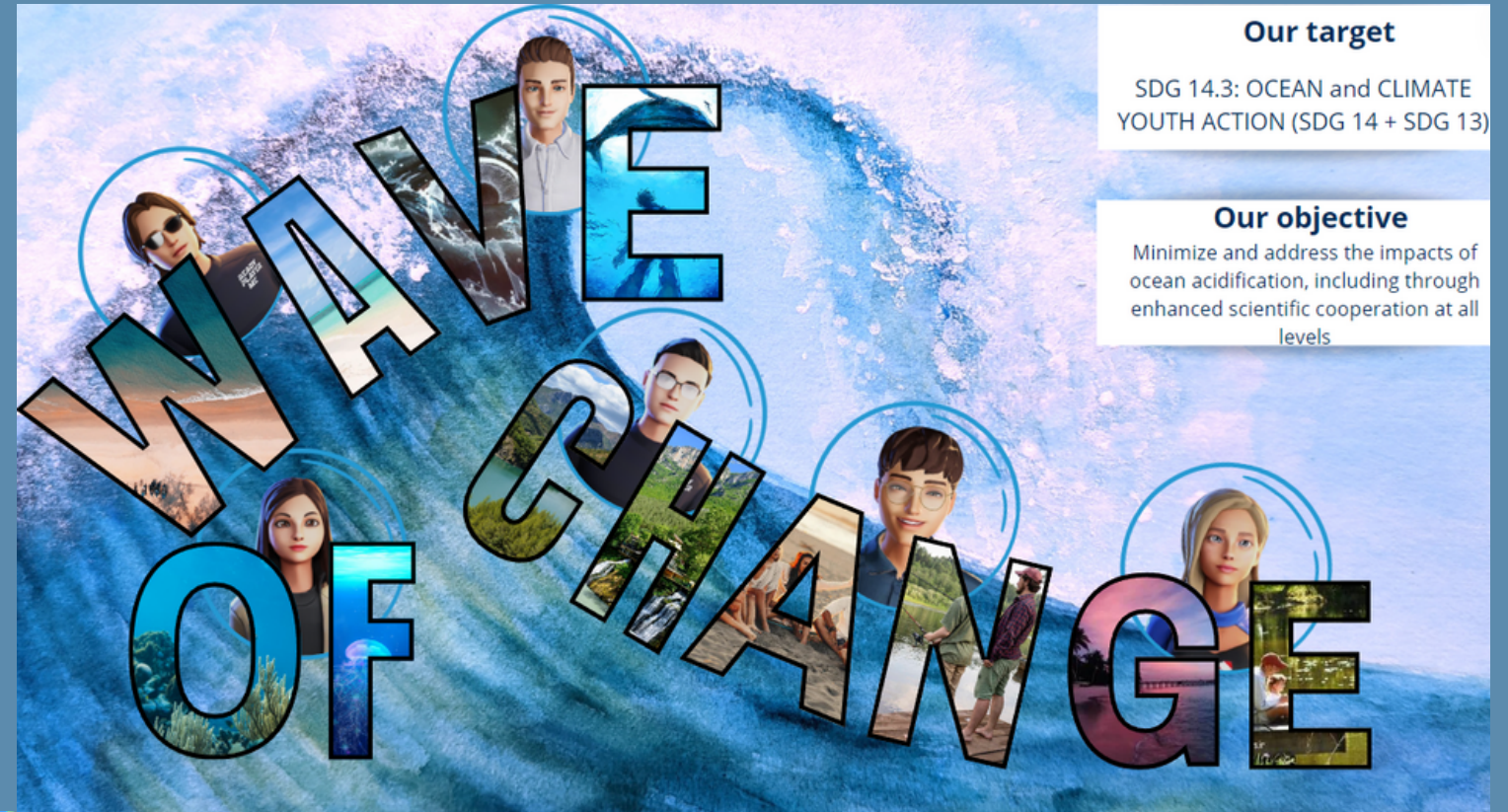
In the end, we decided to divide the presentation into two parts: the first being more theoretical and scientific, while the second was dedicated to a song created by us. This idea came to us after completing the one-pager, so we would like to talk about that before presenting how we structured our project.



Idea for one pager drafted by Oliviero

First and foremost, we wanted to create something that explicitly showcased our connection to the sea while remaining original and reflecting the core of our project: fighting ocean acidification. In addition it had to be visually catchy. After a quick brainstorming session, we decided to create the one-pager with images that evoked memories associated with the ocean. Since using just images would have been too anonymous, we decided to incorporate the images within letters.

Now, all that was left was to choose the name.



Our target

SDG 14.3: OCEAN and CLIMATE
YOUTH ACTION (SDG 14 + SDG 13)

Our objective

Minimize and address the impacts of
ocean acidification, including through
enhanced scientific cooperation at all
levels

"Wave of Change": the first part brings to mind the ocean, while the second part means a moment of departure, of evolution. Our idea was to provide everyone through our project with the awareness of the problem and the possibility they have to generate that change, whether big or small. Like a wave that spreads, sometimes a single idea is enough to create a great impact

In addition, we chose to include our avatars to further endear the audience to us. They were created using the website readyplayer.me and they're placed inside water droplets to indicate that we are not separate from the ocean, but rather connected to it and even originate from there

Do you want to know our connection with the ocean?



Lorenzo Chiri

"It evokes memories of the summer freedom and the lengthy walks along the shore that he enjoyed during childhood"



Oliviero Bruno

"My perception of the ocean changed when I was young and watched a movie called "Children of the Sea." Now, when I gaze upon it, I approach it in a more philosophical manner"



Serena Tannoury

"A near encounter with a jellyfish at the beach during summer 2015, at age 12, left me with a lasting fear of swimming in the sea. Despite my love for water and its tranquility, I now prefer swimming pools due to this fear of what lies within the ocean"



Andi Murataj

"When I look at the ocean, it reminds me of the beauty of the Albanian rivers and how important it is to safeguard them to allow future generations to enjoy their beauty."



Sindi Lelo

"I have fond memories of exploring the entire Albanian coastline and fishing trips with my dad."



Andrea Oliviero

"I go there with friends, for fishing trips, and I even remember slipping on the rocks and breaking my arm when I was younger."



This initial part of the project was essential for opening up and developing other lines of dialogue, such as discussing our personal interests. We discovered that Lorenzo, like Oliviero, is interested in science and the world of startups. Serena and Andi are very creative and skilled in using video editing tools, while Andrea is a big fan of instrumental music. Sindi, in her free time, enjoys singing.

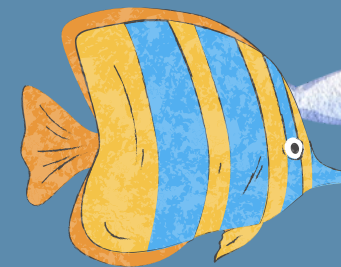
For this reason, Oliviero and Lorenzo primarily focused on innovative startups in the fight against ocean acidification and the initial scientific aspects. Serena and Andi handled the editing of the song. Andrea worked on the musical base, and Sindi provided the vocals.



Contributions (Slide number,
Person who made it)
1-4,21,26 Oliviero
15-18, 23-26 Lorenzo
22,26,27 Andi
26,27 Sindi
19,20,26,27 Serena

Do you want to know how we created the song?

Lorenzo and Serena first searched for the information they wanted to include in the song, while Oliviero and Andrea then took these summarized details and transformed them into verses. Sindi's extensive experience was also invaluable in formulating the song, as her songwriting background trained her mind for this type of work. Subsequently, Andrea worked on the song's soundtrack using various libraries of sound effects and beats. Finally, Sindi provided her voice to create the piece. The song was recorded on Sindi's cell phone and later edited using the Dolby On: Record Audio & Music app. Afterwards, Serena and Andi combined Sindi's vocals with the soundtrack and the lyrics displayed in the video adding images as a background to the song.



Methodology-Blogpost

Which was our aim?

Our goal is to provide anyone reading our blog post with a tool to understand what is happening in the world, to see how others are motivated after being made aware, and hopefully to be inspired by them and take action to address the issue of ocean acidification



The choice to make our essay a highly visual and colorful blog post stemmed from the fact that many scientific topics can sometimes feel heavy and boring. However, this shouldn't be the obstacle that stops us from awareness. That's why we aimed to take a lighter and more enjoyable approach to the project without compromising on the scientific and legal aspects

Contributions (Slide number, person who made it)

1-4 (Title, abstract, keywords, one-pager), 17-21
(Scientific and legal parts of the Results), 31.32
(References) Serena

5-8 (Introduction), 10-15 (Methodology from
Taruma to blogpost), 31.32 (References) Oliviero

9 (Methodology), 31.32 (References) Lorenzo

22-26 (Results' song commentary) Andrea

27-28 (Discussion) Andi

29-30 (Conclusions) Sindi

Results

The results section consists in the findings and final “cake” presentation, followed by a short song commentary. It answers the following two questions:

What is the correlation between the scientific material and the final representation of our work?



What is the final representation answering the SDG goal 14.3? A brief commentary will follow.

How can we relate them to the principles of Administrative Law in the protection of the oceans?



The correlation between the scientific material and the final representation of our work

Understanding of the interconnectedness of marine sustainability challenges



The Earth System Science is our starting point. It briefly represents the area of study that seeks to understand Earth as an interacting set of physical, chemical, and biological systems. ESS is a new science of the Earth, merging the knowledge. It is all connected. It is also connected to our song, you'll see that later!

Point source pollution- any single identifiable source of pollution from which pollutants are discharged, such as a pipe..." Example: image shows a point source of industrial pollution along the Calumet River. Photo: U.S. Environmental Protection Agency, Region V.



Another interesting topic we have discussed in class is the one of coastal zones. A coastal zone is that part of the land surface influenced by marine processes, it is the interface between sea and land.

The case of the Arctic: we are currently witnessing the erosion of the Arctic coast that could double in pace by 2100 as a result of climate change, releasing organic carbon that has been frozen in the permafrost for millennia. This collapse is injecting into the atmosphere a large amount of CO2 that is contributing even further to the effects of climate change.



How does human behavior affect seas and oceans?
"Pollution of the marine environment" means the introduction by man, directly or indirectly, of substances or energy into the marine environment.
We are entering an unknown territory of marine ecosystem change that might endorse migration or even extinctions of marine organisms.



Arctic coastal erosion accelerates permafrost carbon loss - uncertainties and impacts

The principles of Administrative Law in the protection of the oceans

An Administrative Law of the Sea- around the world

Unified International Policy to Address Ocean Acidification

The United Nations Convention on the Law of the Sea lays down a comprehensive regime of law and order in the world's oceans and seas establishing rules governing all uses of the oceans and their resources. It enshrines the notion that all problems of ocean space are closely interrelated and need to be addressed as a whole. This is where we intervene, since our objective is to minimize ocean acidification at "all levels".



European Union: European Climate Law

The European Climate Law was enacted to support the objectives of the European Green Deal, which aims to ensure the EU is climate neutral by 2050. It also provides milestones that must be met on the way to achieving climate neutrality in 2050, such as to reduce 55% of the EU's greenhouse gas emissions by 2030. The European Climate Law will establish methods to monitor progress toward their objective and to guarantee that the target of climate neutrality by 2050 can be met. Although ocean acidification is not the primary focus of the law, it may be addressed by major emission reductions across the European Union.



United States

Federal Ocean Acidification Research and Monitoring Act

This federal law mandated the establishment of the Interagency Working Group on Ocean Acidification (IWG-OA). The interagency group is embodied by multiple government organizations led by National Oceanic and Atmospheric Administration (NOAA). The primary goal of the IWG-OA is to conduct research that will provide more information and discoveries regarding the effects of ocean acidification. It also covers the identification of conservation and adaptation plans for marine resources and areas of the country affected by ocean acidification.



Coming back to our main focus, that is, UN SDG 14.3, below is a brief creation of its meaning, impacts on the ocean and marine life and some factual data...but not only!



WHAT IS SDG 14?

The goal of SDG 14 is to "conserve and sustainably use the oceans, seas, and marine resources for sustainable development." The target is to reduce pollution by 2025, enact laws to protect the biodiversity and reduce acidification of water.

We have also seen the individual and collective efforts that people have put into reducing ocean acidification at national level (Netherlands, Italy, India), with global influence. Scroll down for more!

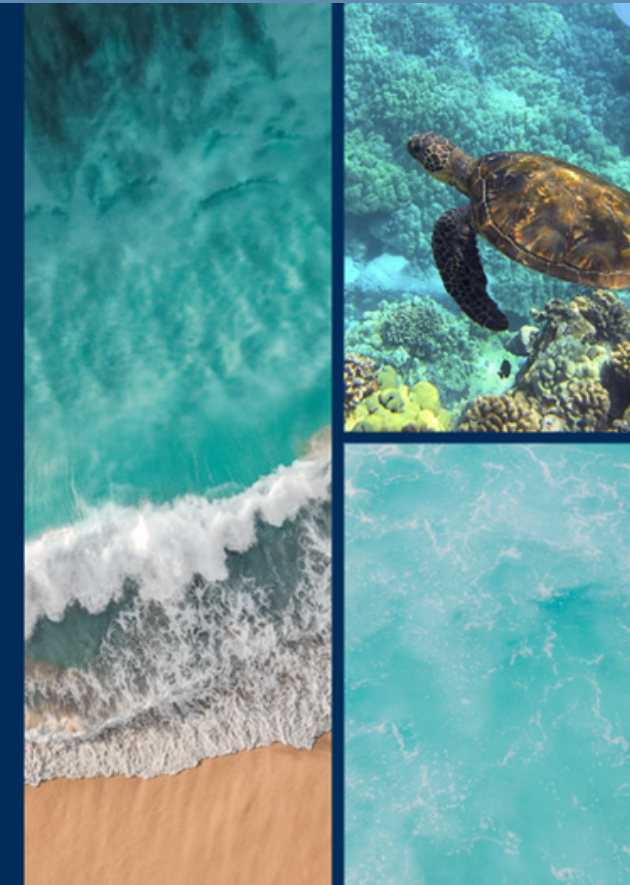


Three Billion people depend on the Biodiversity of our oceans. It is fundamental to protect and ensure the Hydrological System of our planet to save also our "life on surface".

The Acidification of the Water

Ocean acidification is the process by which carbon dioxide (CO_2) from the atmosphere dissolves in seawater, lowering its pH.

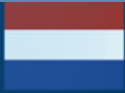
This decrease in pH makes the water more acidic, which can harm marine life, particularly organisms like corals, shellfish, and plankton with calcium carbonate shells or skeletons. Human activities, such as burning fossil fuels and deforestation, release large amounts of CO_2 , contributing to this phenomenon, which poses a significant threat to marine ecosystems and biodiversity.



Case study #1



THE OCEAN CLEANUP



Problem: more than 5 trillion pieces of plastic currently litter the ocean

Founded in 2013



THE OCEAN CLEANUP

Collecting ocean garbage using innovative technology

The system could clean up 50% of the Great Pacific Garbage Patch in 5 years



Case study #3



NARAYANA PEESAPATYA



Problem: Impact and damage of plastic cutlery

Foundation of Bakey's Food Private Limited

- Edible cutlery made from flours of jowar, blended with rice and wheat
- 100% natural cutlery, biodegradable and edible.
- Reducing the amount of plastic that ends up in our water systems, helping the health of marine life, our oceans and us.



Case study #2



RELICTA



What's it?

Young Italian startup (2020)

How does it work?

Bioplastic from waste, water-soluble, biodegradable, for packaging



relicta
innovation of packaging

How can it help the ocean?

8 MLN tons of plastic thrown into the ocean + many problems with degradation. RELICTA would solve this problem

Then we have asked ourselves: if others could do it, then we can do it too! We can save the oceans, we can combat ocean acidification like others are already doing.

That is the main purpose of the song we have co-created, aiming at creating awareness, knowledge, inspiration, and calling ourselves and the others to action.

The final representation answering the SDG goal 14.3



Opening

***In this world of blue,
where the oceans gleam***

***we can't deny the truth,
it's not a dream***

The opening line sets the scene in a world symbolized by oceans. The second line suggests that the situation described is not a fantasy but a reality that must be faced.

Call to Action

***The time has come
for us to rise,
with every voice
we'll reach the skies***

This part of the song urges people to rise up collectively, implying a call to action to make a change.

A seagull is in flight, its wings spread wide, flying over a dark, mossy rock. In the background, waves are crashing against the shore, creating white foam. Another seagull is visible in the upper right corner, also in flight. The sky is a pale, hazy blue.

Chorus

***We are the waves of change,
crashing against the shore***

***with every action we take,
we'll change the world
forevermore***

This is the core of the song which also contains its title. The idea of waves crashing against the shore symbolizes the collective power of individuals working together to create change.

A large iceberg with a dark, rocky interior is melting in the water, surrounded by smaller icebergs and a vast field of icebergs in the background. The scene is set in a calm body of water under a soft, overcast sky.

Ending

*The rivers and the seas,
they're crying out for help

together we will heal them,
and save ourselves*

This part highlights the urgency of addressing environmental issues, particularly the degradation of rivers and seas. The last segment emphasizes that our actions have consequences not only for the environment but also for us.

Discussion

WHY A SONG

During the first days we had many discussions about the way we wanted to communicate our message, and who would be our target audience.

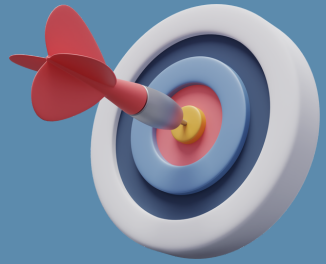
We first thought about playing a short theatrical scene, in which we would explain more of the consequences of not respecting the nature, and especially the ocean, but this was only one of many creative ideas we had.

...and there is not a limit for the number of times you listen to a song. What's better than taking a shower and listening to something that raises awareness about water preservation.

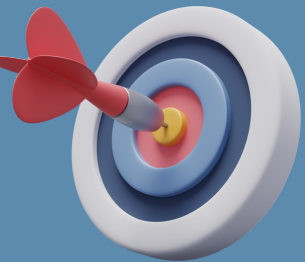
In the end, we came up with a song, which, in our opinion, has a stronger impact. Songs are usually considered a good way to focus, calm down and enjoy your time, so, we wanted to make sure that everyone would enjoy their time by listening to our song...



WHAT WE AIMED FOR..



While we prepared the song, lyrics and the melody, we kept in mind our target audience, which includes all ages, from children in school, students in university to professors and parents.



The objective is that the song can be listened to in universities and schools, but that's not a limit. We believe that studying, reading and passing an exam is not the only way to learn. You can learn while playing as well, or by making the lecture a bit "fun", and the song can be one of these cases.



Some of the limitations we had faced were the time we were given to come up with short presentations for three successive days, as we have also taken some extra time to create some hidden associations and to connect the scientific materials with the song we have created. One last struggle was putting all our ideas in one consistent project, given that we had multiple ideas and creative works (theater scene, song, short movie, game). At the end, we were able to come up with a mix of all, a consistent work grouping most of the aspects we wanted to elaborate on in a summarized form with hidden and extensive connections, that we have previously revealed in our song commentary.

Conclusions

Nurturing Environmental Consciousness Through Administrative Law and Creative Endeavors

Embarking on the journey of Administrative Law, I never imagined that it would lead me to the shores of environmental conservation, particularly the preservation of waters and the pursuit of Sustainable Development Goal 14 (SDG14). However, as the semester unfolded, it became increasingly evident that administrative law serves as a linchpin in our collective efforts to safeguard our planet's most precious resource—the oceans.

True! Through collaborative endeavors, we were able to translate our newfound knowledge into tangible action through our project "Wave of Change." From the inception of this endeavor, our aim was twofold: to creatively engage with the principles of administrative law and to galvanize youth action for environmental preservation.



Central to our project was the creation of a song—a melodic manifesto that echoed the interconnectedness of humanity with the oceans. This musical endeavor transcended conventional boundaries, serving as a rallying cry for stewardship and sustainability. Furthermore, the inception of the board game "Chiquitano Revival, inspired by the book "Taruma, waters that speak", a book written by our pedagogue Margherita Paola Poto and her colleague Giulia Parola, underlines our commitment to create another interactive way to raise the voice of this book and bring their story to life through a game.

The culmination of our project brought forth a realization—a realization that the principles of administrative law are not confined to legal textbooks but are intrinsically intertwined with our collective responsibility to protect our planet. Moreover, it reaffirmed the transformative power of creativity in fostering environmental consciousness and mobilizing youth action.



The Intersectionality of Disciplines

The Power of Creativity in Advocacy

Youth as Agents of Change

As we reflect on the conclusion of this journey, it becomes abundantly clear that the lessons learned extend far beyond the confines of the classroom. They are a call to action—a call to harness the principles of administrative law and the transformative potential of creativity to nurture a more sustainable future for generations to come.

In conclusion, as stewards of the earth, we must embrace our role in safeguarding our planet's most precious resources. Through the synergy of administrative law and creative endeavors, we can chart a course towards a more equitable, resilient, and environmentally conscious world.



Creation of the board game of "Chiquitano Revival". by Sindi

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