

Working with climate change

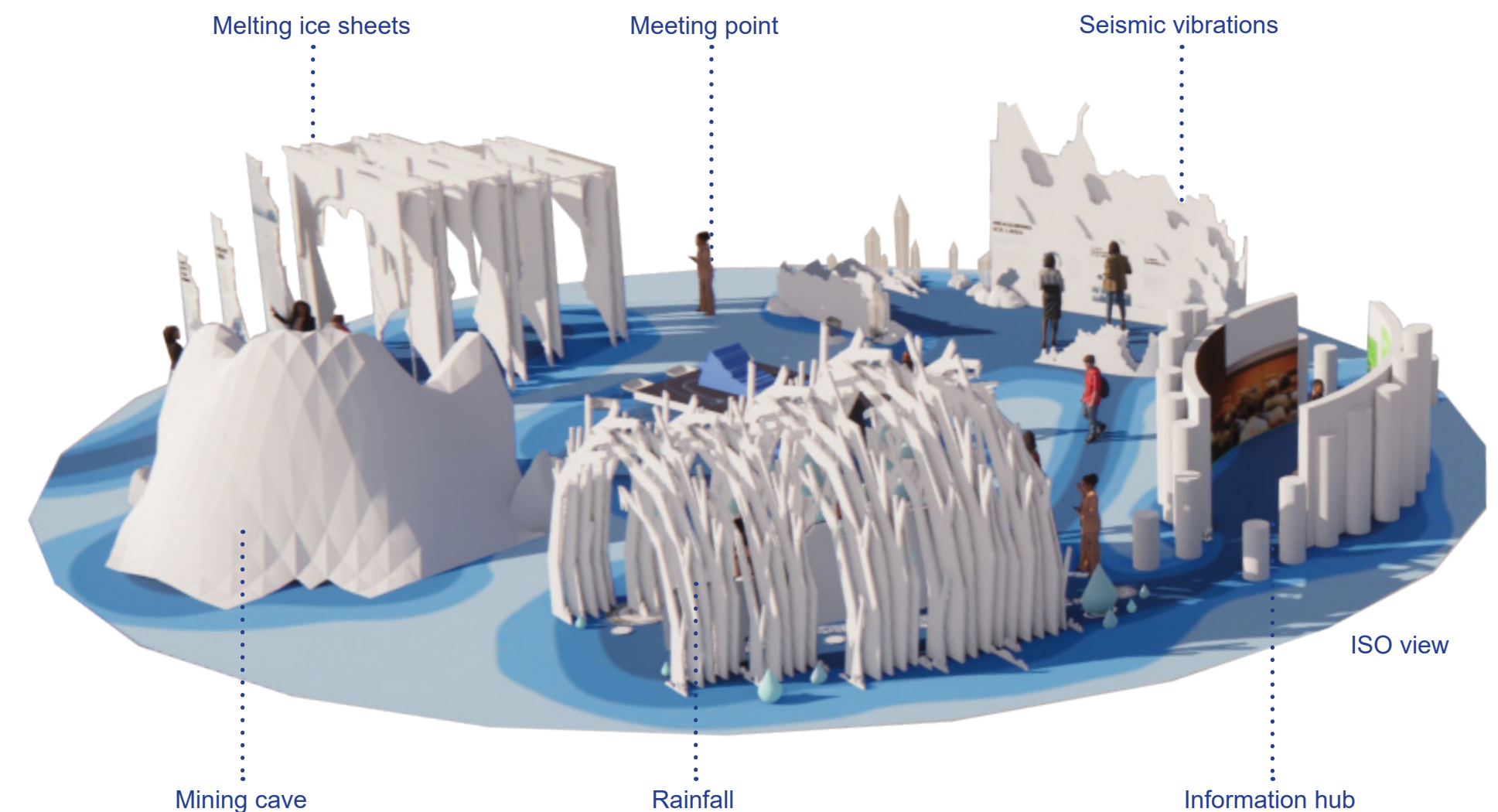
By Sophie Baird-Carson and Vanesa Burlacu

Project mission statement

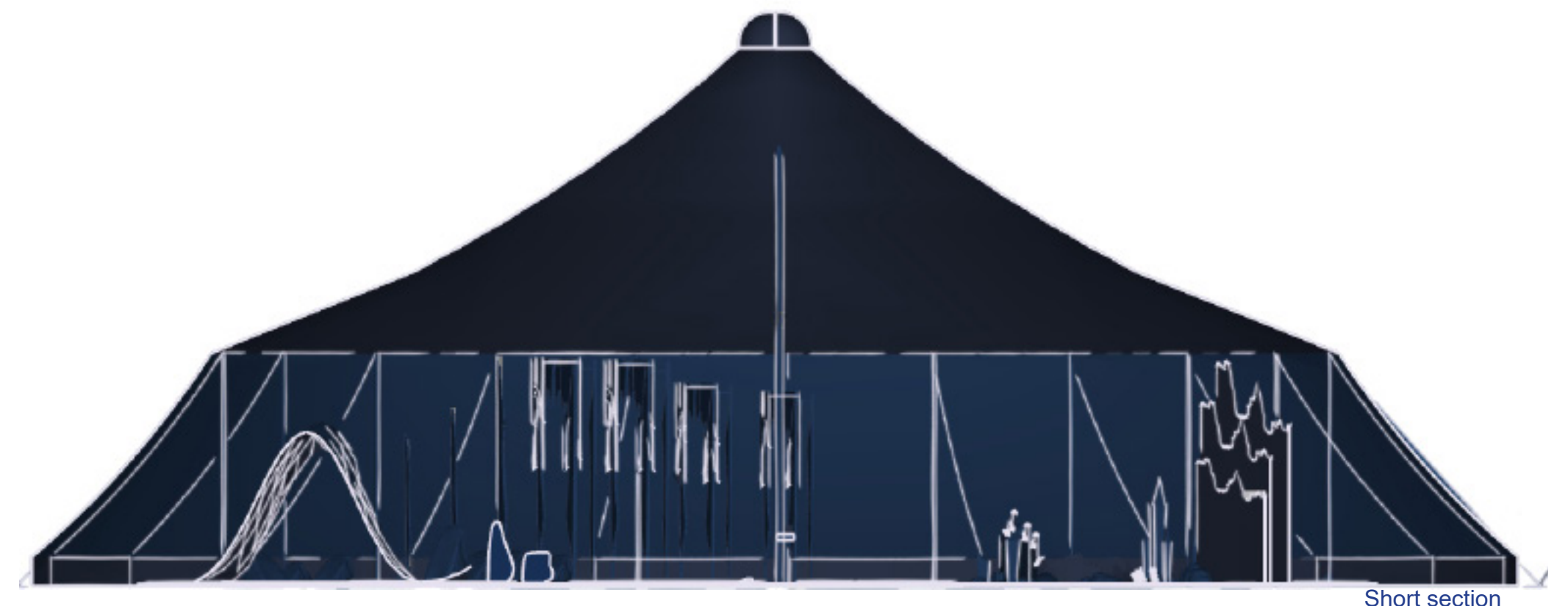
This project aims to create an innovative, engaging and visually striking exhibition that highlights Greenland's solutions to the climate crisis. Drawing inspiration from Greenland's environmental ethos, it showcases how the nation addresses critical challenges through sustainable innovation.

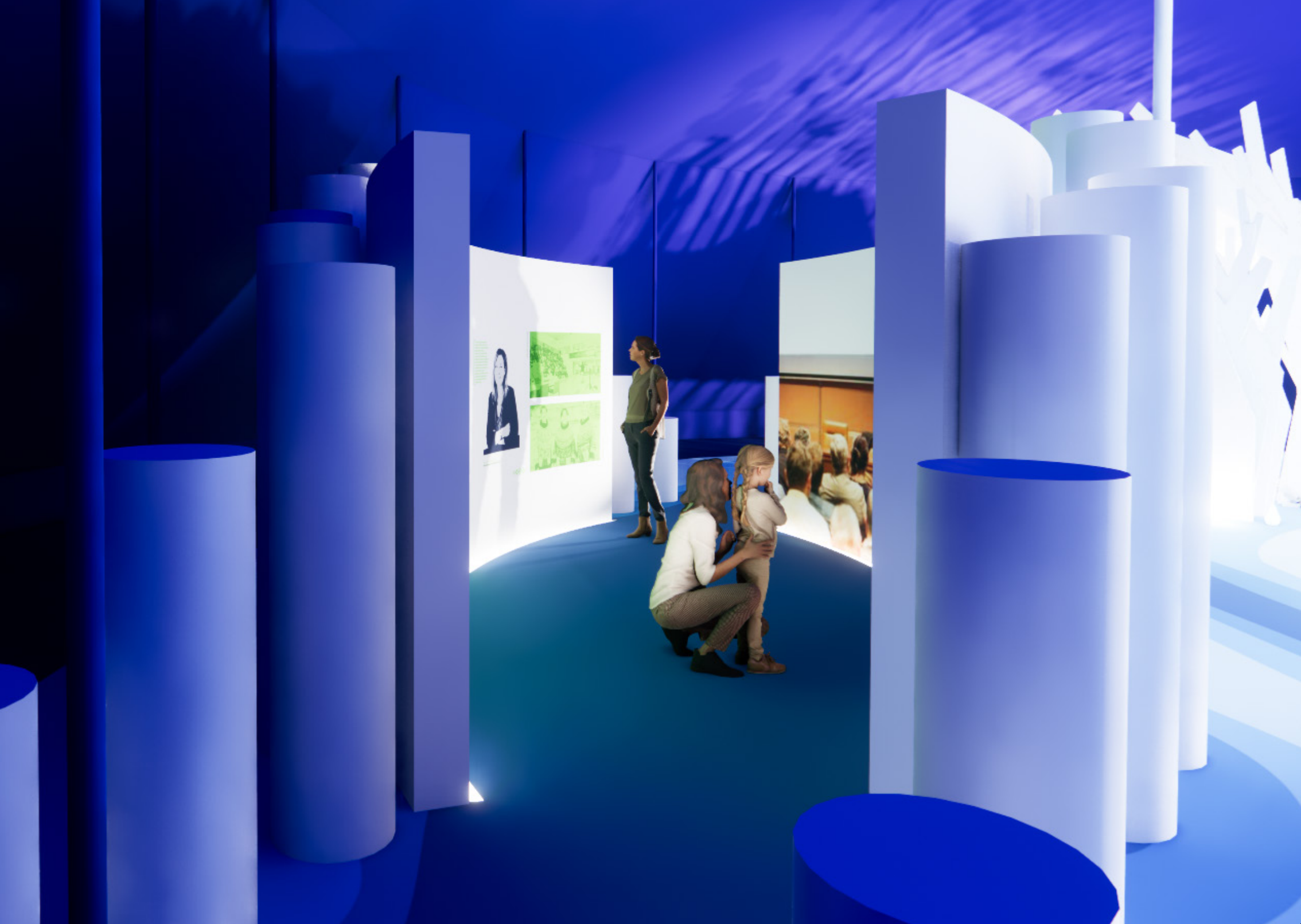
By blending informative content with a flexible and immersive design, This exhibition seeks to inspire and educate visitors about the unique efforts Greenland is making to preserve its natural environment and combat climate change, as well as how they are the only country embracing it.

Looking into the layers



The layout of the design is very tactical in exploring the layers of climate change in Greenland, first the entry will take you through the information hub, where it will aim to introduce you to the problems that Greenland is facing with climate change and what they are doing to change it, the next stop will then be Greenland's response to rainfall, where it will focus on how Greenland is trying to be resourceful with what they have already in order to keep its residents safe, then the rock flour cave, where you will be transported by walking underneath the cave to reiterate to people that Greenland already have a solution right under their glaciers, this will then lead onto the seismic vibrations exhibition where it will explain exactly how Greenland is responding to their melting ice sheets and how they are monitoring this process in order to prevent a disaster from happening, then it will take you through the melting ice sheets where it will explain that despite all of the problems Greenland are trying to solve with climate change they are trying to embrace it as much as they can due to most of it being irreversible. Finally there will be a meeting point in the middle where people can look at our interactive screen to see what point is where and enjoy a seat to discuss what they have experienced in this exhibition.





The information hub



Graphics- Rowan

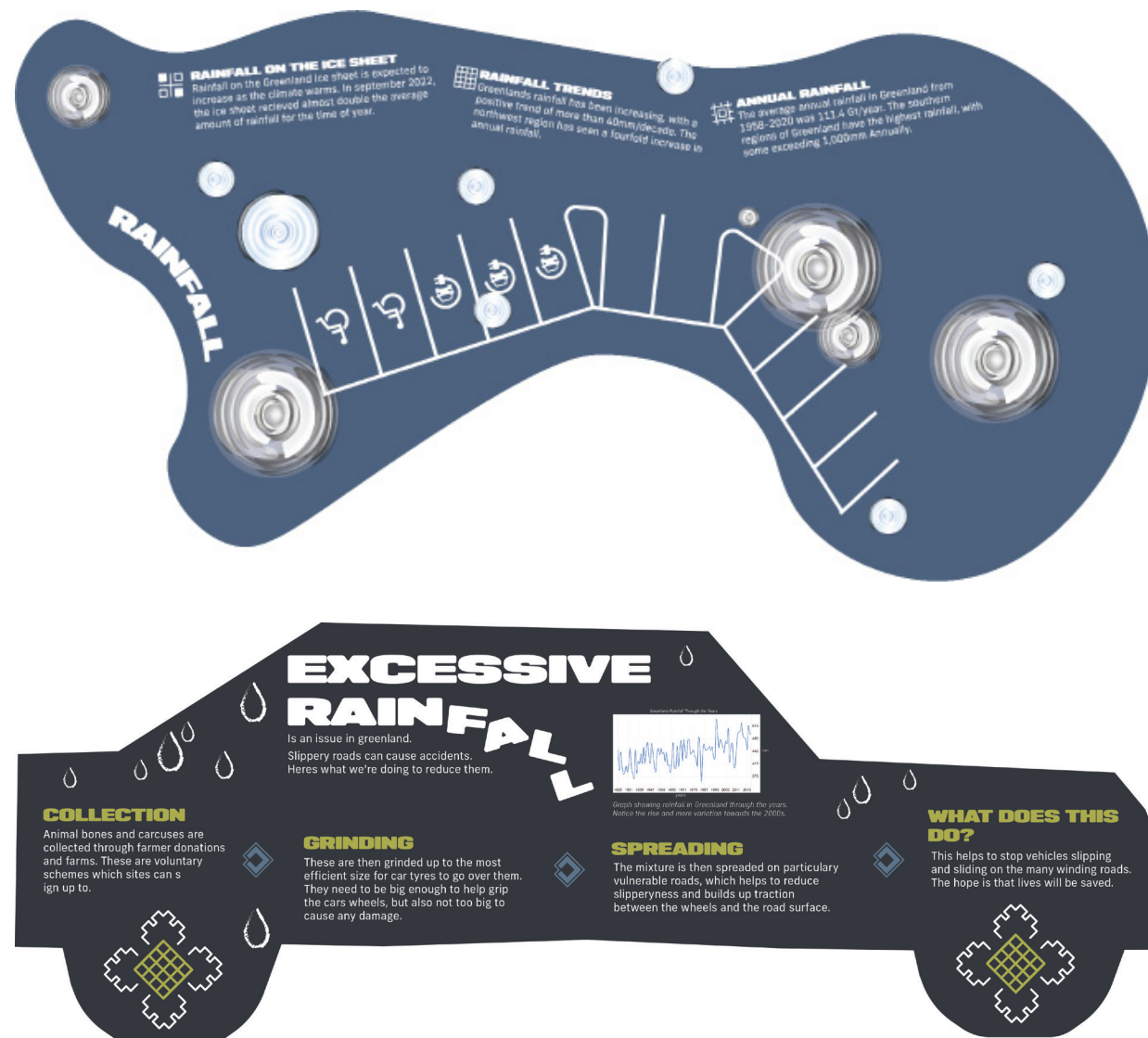
The international Arctic hub, in Nuuk Greenland, creates a bridge between science and the community, and between knowledge and action.

Purpose-

The Arctic hub is a point of contact for anyone involved in research in Greenland. The hub is founded on the basic understanding that knowledge is most valuable if it is shared and activated.

it specifically focuses on climate change topics, organising workshops, creating public facing communication (e.g. articles and videos) and training researchers and journalists to effectively share findings.

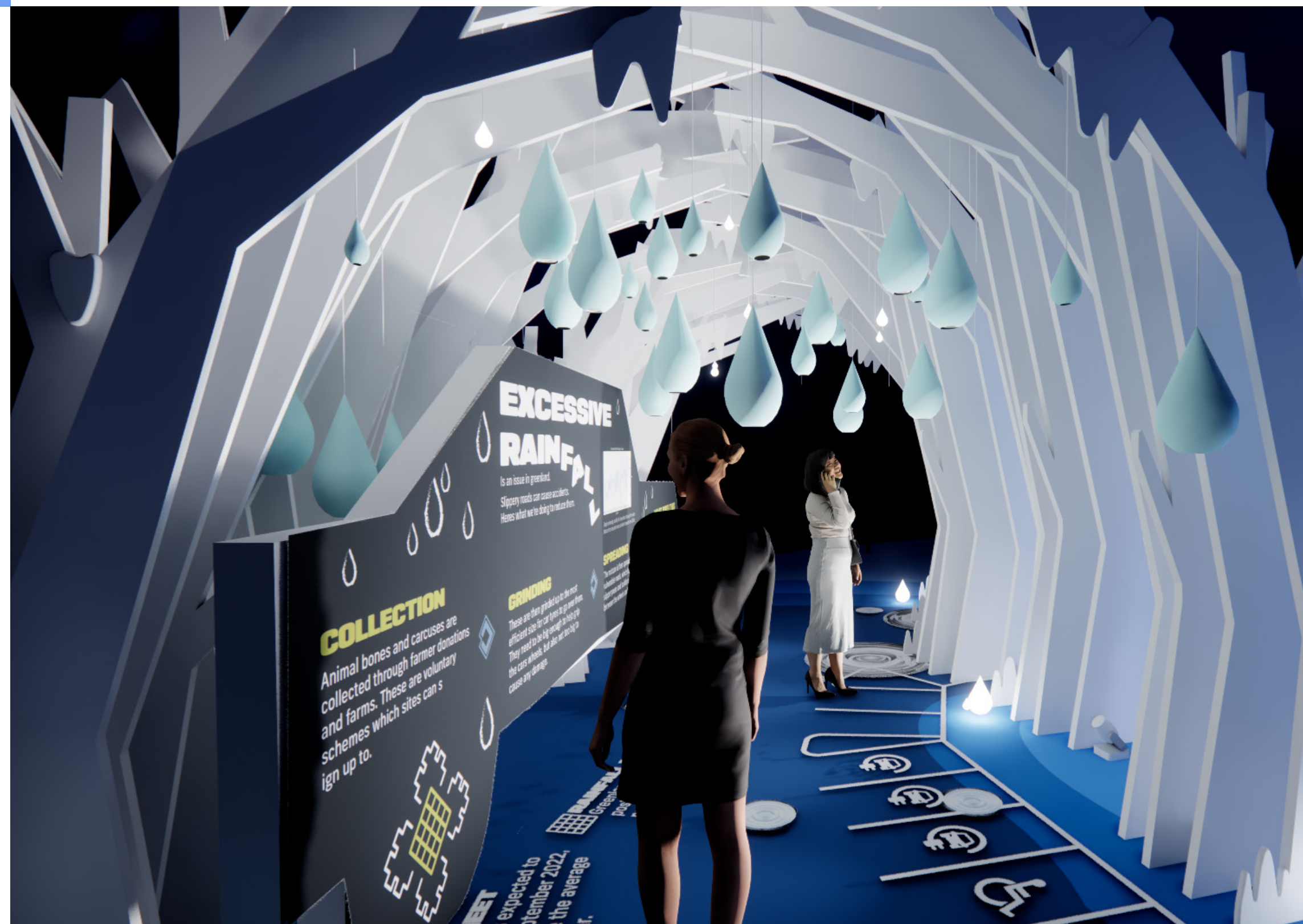
Excessive Rainfall



Rainfall on the Greenland ice sheets is expected to increase as the climate warms. Students in Greenland came up with a unique solution to this problem to try and work with what they have in response to the excessive rainfall.

The excessive rainfall is causing slippery roads that then lead to accidents. The solution is animal bones. They will be collected through farmer donations and farms, they are then grinded up to the most efficient size for car tyres to go over them, the mixture is then spread on particularly vulnerable roads, which helps to reduce slipperiness and builds up traction between the wheels and the roads surface which results in vehicles stopping sliding on the roads.

Graphics- Cameron





Rock Flour



Rock flour is a by-product of glacial activity. This fine material holds the potential to revolutionise agriculture, construction and renewable energy.

Greenland's ice sheets are already producing around 1 billion tonnes per year of fresh rock flour, it is already perfectly grounded without the need for machines to do it. So they decided to use it to their benefit.

When rock flour is spread on soil, it reacts with rainwater and atmospheric co2, which then forms stable carbonates that eventually wash into oceans, this process removes co2 from the air and locks it away for hundreds of years

It helps improve soil health and pH, it boosts crop yields by 20-30%, Reduces the need for chemical fertilizers

Graphics- Cameron

Measuring Ice Loss

MEASURING ICE LOSS

Monitoring the effects of climate change in Greenland has been made much easier with an innovative method developed by researchers at DTU using 61 national GPS stations in Greenland.

When the ice sheet in Greenland melts, so it has done increasingly in recent years, the bedrock beneath moves slightly. This allows scientists to measure how the ice sheet is moving, causing the bed beneath to rise. This elevation change can be measured and revealed into how much the ice sheet is disappearing from Greenland's ice sheet and how fast it's happening. New, researchers at the Technical University of Denmark (DTU) have developed a method based on this principle, allowing daily tracking of ice melt for the first time.

The new GPS method represents a significant advancement in monitoring ice mass loss in Greenland and understanding the processes behind the ice melting. Consequently, scientists can use the ice sheet's movement to predict future ice sheet melting and the contribution of meltwater to the rise of global sea levels.



"This is the first time we can measure the entire mass loss of the ice sheet day by day. For example, satellite gravity measurements show mass loss every month. Other methods only provide a single estimate per year. This means that we have not been able to monitor the sudden changes in ice mass loss that often occur in the summer period."

STATE MEASUREMENT STATIONS

Measurements are made using the Danish state's GNSS, which consists of 61 GNSS stations located around Greenland.

GNSS stands for the Global Navigation Satellite System, and it includes the European GPS system and the European Galileo. With GNSS technology, movements in the bedrock over time can be detected with sub-millimetre precision.



FLOOD WARNINGS

The new system and the estimates of ice loss can also be used for practical purposes, such as warning residents in Greenland if large amounts of meltwater are suddenly released.

"By calculating daily changes in the ice sheet's mass, we can monitor the melting season and warn the local population if there is a risk of flooded rivers. For example in 2012, the bridge collapsed at Kangerlussuaq, also known as Søndre Greenland, due to extreme melting. With the new GPS-based method, we can better monitor and potentially warn if such events are imminent."

Shirazat Abbas Khan
DTU Space Professor

Graphics- Rowan

Monitoring the effects if climate change in Greenland has been made much easier with an innovative method developed by researchers at DTU using 61 national GPS stations in Greenland.

The way it works is GPS stations are installed on and around the ice sheets, it helps detect the difference between ice loss and natural glacial movement, it is monitored by NASA and many more scientists.

This will help with sea level forecasting- coastal planning and disaster prevention.

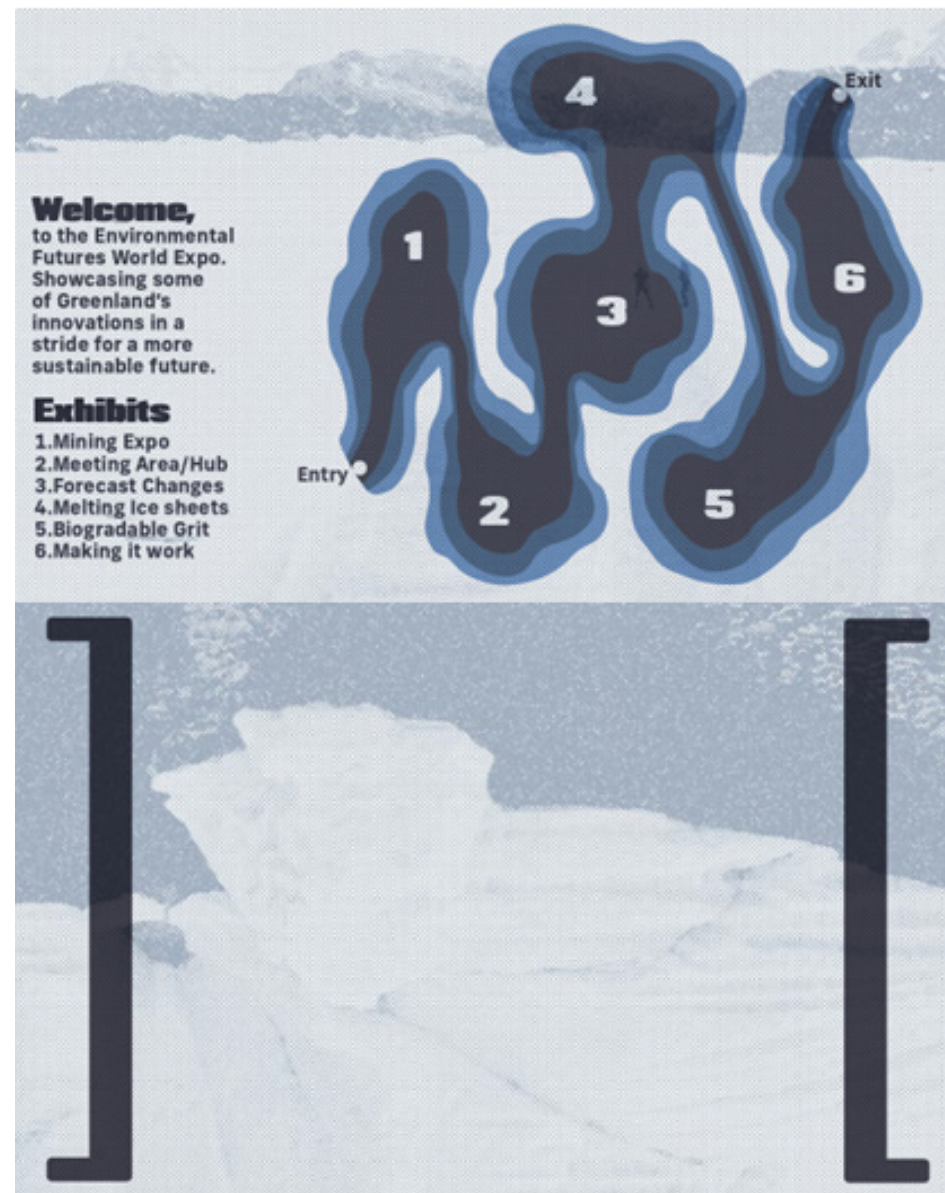
Climate modelling- A better prediction of earth's warming path

Arctic resilience- helps green-landers plan for environmental shifts

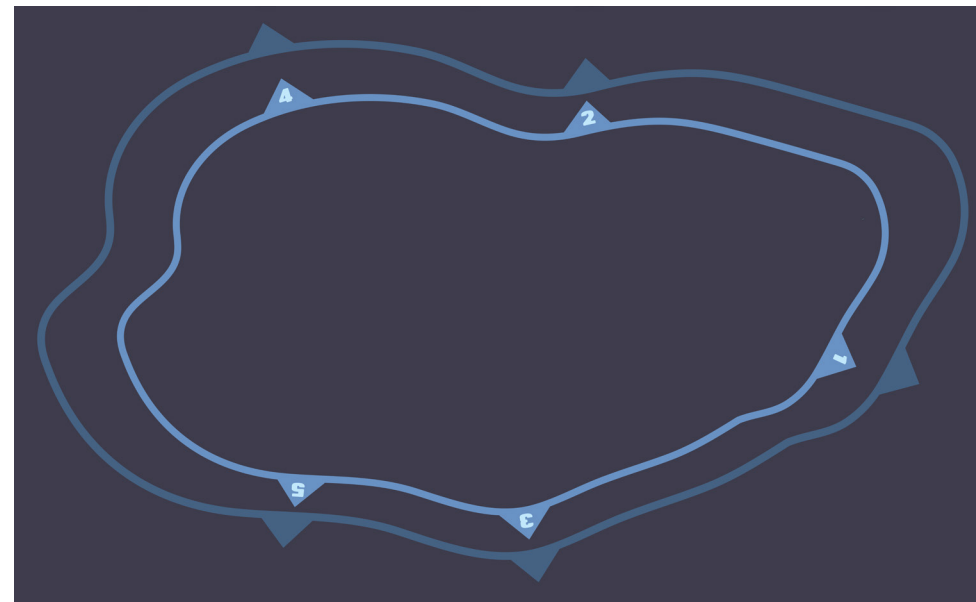




Meeting point



Graphics- Kai



The meeting point will be for people who want to have a seat and talk about what they have seen in the exhibition, it will be a good opportunity within the space to allow people to interact with each other, the table will have an interactive screen on it that will point you in the direction of each section in the exhibition and you can press on the number and it will pop up a brief explanation of what that section of the exhibition is about, this will also be the place that holds the physical maps of the exhibition in case people want to take them home.

Accepting climate change

LIVING DESPITE GLOBAL WARMING

Climate change might in general be considered a global disaster, but there are some potential benefits in store for Greenland. Rising temperatures are favourable to many national industries.

The vast majority – more than 90% – of Greenland's export income is from fish, and as seas warm, an increasing number of southern fish species find their way into Greenland's oceans, creating new opportunities for fishing.



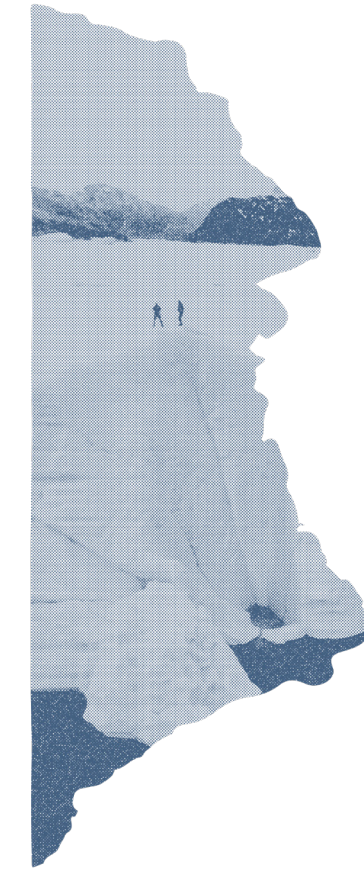
Fishermen report that cod stocks are getting bigger and bigger, and that while Greenland's "pink gold", cold-water shrimp, is moving further north, new fish species, such as mackerel, herring, cod and Atlantic bluefin tuna – are entering the country's waters. Warming temperatures also mean that fishermen can extend their seasons, allowing them to catch more fish.



FRESH NOT FORZEN

Similarly, warming temperatures are proving beneficial for the agricultural industry. As a milder climate means that the growing season gets longer, there are more opportunities to produce crops for local consumption in Southern Greenland, without having to import them from Denmark.

However, the weather is still unreliable. Additionally, an increase in extreme weather behaviour, such as droughts, has caused farming and livestock rearing to become more challenging in some parts of the country.



Graphics- Kai

How Greenland is living despite global warming- Climate change might in general be considered a global disaster, but there are some potential benefits in store for Greenland, rising temperatures are favourable to many national industries. More than 90% of Greenland's export income is from fish and as seas warm, an increased number of southern fish species find their way into Greenland's oceans. It also helps with their agricultural industry, as the milder climate means that the growing season gets longer, meaning that there is more local opportunists to produce crop rather than importing from surrounding countries. Despite it helping Greenland in these ways they are still trying to tackle climate change in significant ways and pouring the money back into research on how to reverse the effects of climate change.

