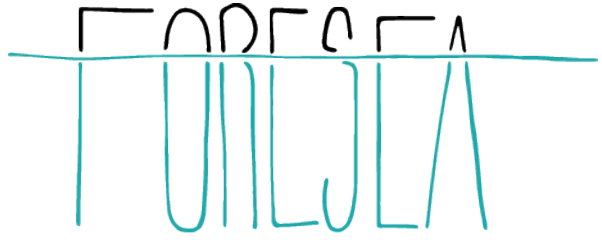

FORESEA
AN INSTALLATION ABOUT
SEA LEVEL RISE AT OEROL 2016



INSTITUTE OF PLACE MAKING

COLOPHON

The course 'AR0148 - landscape architecture ON site' is initiated by the Chair of Landscape Architecture in collaboration with Oerol.

Authors: Jade Appleton, Jolien Boas, Leyang Chen, Filiz Coskun, Jean Pierre Droge, Nora Hartman, Sicco Jansen, Pien Kuijpers, Jaap Le, Annemette Scheltema, Lilian Tran, Erika Wolters.
Teachers: Frits van Loon and Michiel Pouderoijen

Published by TU Delft, 2016
Contact: Frits van Loon, f.d. van Loon@tudelft.nl & Michiel Pouderoijen, m.t.pouderoijen@tudelft.nl
Website: www.iopm.nl

Printed by: Tan Heck
Print run: 50

PARTNERS AND SPONSORS

We are indebted to many people who made the project possible. First of all we would like to mention Kees Lesuis, creative director of Oerol, who invited us again this year to participate and make a project for the 'expedition' of Oerol. We also owe a lot to Anemoon Elzinga, production manager of our expedition project and her predecessor Gerjan Schreuder, who have been inexhaustible in their assistance during the production of the project. Both Kees and Anemoon have given valuable input during crucial stages of the project.

We also would like to express our gratitude to the sponsors of the project: Delft Infrastructure and Mobility Initiative (DIMI), Stichting NH Bos and Waddenacademie. The scale of our project was ambitious from the outset, and their financial backing was vital to seeing us through the complications along the way.

Special thanks to Jan Roelof Witting of Rijkswaterstaat, who salvaged our project at the eleventh hour. His concerns and support for the project were wholeheartedly appreciated - it could not have been realised in its grand form without his contribution.
We would also like to thank Jetze de Beer for his extremely generous offer to use his workshop during the building days, including a crash course welding.

The companies Trip Hek and De Vlas enormously helped us with their quick response to our close to impossible transport and construction wishes.
During the festival we were warmly received by the staff of pavilion Kaap Hoorn, who offered us unlimited access to their facilities and a quiet place to work.

The value of all the contributions from experts shouldn't be underestimated. John Lonsdale (Architect), Maartje Keijzer (Director and Dramaturge), Remi Hougee (forester Terschelling, Staatsbosbeheer), Steffen Nijhuis (Assistant Professor Landscape Architecture), Matthieu de Schipper (Assistant Professor Coastal Engineering), Albert Oost (Researcher Deltares), Thijs Asselbergs (Professor Architectural Engineering), Annebregje Snijders (Lecturer Architectural Engineering) and Calcen Chan (graduate student Architectural Engineering), Ianus Keller, (Interaction Designer/ Researcher, Industrial Design Engineering), Joost Emmerik & Lara Voerman (Designer/Reseacher at SteenhuisMeurs) shared their knowledge with us, thanks!

The Chair of Landscape Architecture is greatly appreciated for offering the opportunity to teach this extraordinary course and for its generous support. A word of thanks to the secretariat of Urbanism as well, namely Annemieke Berger, Linda de Vos, Astrid Roos-Aukes and Margo van der Helm for their administrative support.
Finally, to all the friends and family who have supported us along the way, thank you all!

oerol

DIMI Delft Infrastructures & Mobility Initiative

STICHTING N·H·BOS
ter bevordering van de landschapsarchitectuur

Rijkswaterstaat
Ministerie van Verkeer en Waterstaat

waddenacademie

FOREWORD

The 'Oerol course' AR0148 is an experiment in many ways. It is an experiment with education methods, design methods and group work. It is an experiment on the cutting edge of landscape architecture, art and theatre, bringing together students and tutors with different expertise and backgrounds. It is an experiment in constructing a project in an extremely short time, but still offering space for trial and error to learn from. It is an experimental experiment, testing a landscape art installation for the first time through interaction and participation with visitors to the Oerol festival. It is a research experiment, collecting data in a non-scientific setting.

We feel very privileged that Oerol gives us the space and trust to carry out experiments for so many consecutive years. Even more so because experimentation involves risk-taking, and risk-taking might lead to success and unprecedented results, but can also lead to failure. This year we came very close to both, close to failure in the construction phase just before the festival started, but also very close to an extremely interesting result: a real-size graph scaling the opinion of visitors on sea-level rise in an interactive way, represented through a sea of ropes spun between 5 metre high steel poles, with a stunning visual effect and a true opening of debate among visitors.

We are indebted to many people, but above all to an extremely inspiring group of twelve young people who taught us as much as we taught them, working incredibly hard in a close to professional way, with appreciation for each other's ideas and with a lot of pleasure. The project was temporary, but the experiences and memories will remain forever.

Frits van Loon & Michiel Pouderoijen

Delft,June 2016

CONTENT

ABOUT FORESEA

Ahoy sea makers!

Welcome to Forsea - a project that provokes discussion about the issues of sea-level rise. The idea was conceived from research in Nature (March 2016) which explains that Antarctic ice is melting much faster than predicted, and consequently the sea level may rise as high as six metres in year 2200 and even eighteen metres in the year 2500.

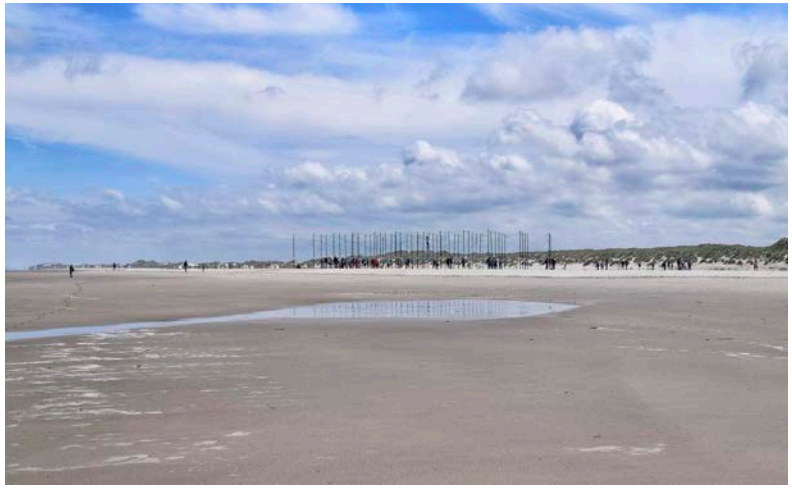
However, lofty statistics like these can easily turn into throwaway sound-bites. They disconnect us as individuals from the issue at hand by reducing the problem to a number, without a second thought as to what the consequences might mean for us personally. Thus we travelled to Oerol to make a large-scale, spatial installation that visualised the problem in a more tangible form, and immerses our visitors in the potential future scenarios.

The overall aim was to bring more meaningful awareness to the subject. We created a space in which Oerol-goers could debate issues about climate change and sea-level rise such as: whose responsibility is it to tackle the problem; is it still possible to reverse the causes; and what are we, as individuals, prepared to do about it? To inspire this debate, we built a large structure of 57 steel masts, each reaching up to 6m above the sea level to represent the future of the sea in 2200. We crafted provocative statements regarding issues about climate change for each mast, and asked visitors to rate how much they agreed or disagreed. They then registered their answer with a 'waterline' between the two statements. We had some fascinating discussions with our visitors, and their views were wide ranging.

Our installation was thriving with visitors - over 6000 people contributed to our conversation, thus the sea of strings grew thicker by the day. In the end we had produced a large-scale interactive infographic that casted a striking and beautiful image against the empty sea. In addition the new sea level became more visible in parallel to greater awareness and concern amongst the sea makers. By contrast where concern was registered as low, the strings turned into physical obstacles for future visitors. In this way, it was akin to the notion that ignoring climate concerns is convenient for ourselves, but makes life harder for the future. Tackling sea-level rise requires effort and determination, as represented in the difficulty of attaching threads at the top of the masts.

The response to the project was really positive, and we were all very happy that visitors enjoyed the experience. We were also featured in the Oerol newspaper, RTL nieuws, and were interviewed in a talkshow by Paulien Cornelisse.

On the day of the highest high tide the visitors had to walk through the water to get to the installation.



The rigger's ruler for cutting the strings at the right length.

Sign placed on the way to the installation to create curiosity.

The poles could be seen from more than 5 km distance on a clear day.

The wind created a notion of waves in the strings.

At low tide dark blue string was used and on high tide turquoise.

RENDER…

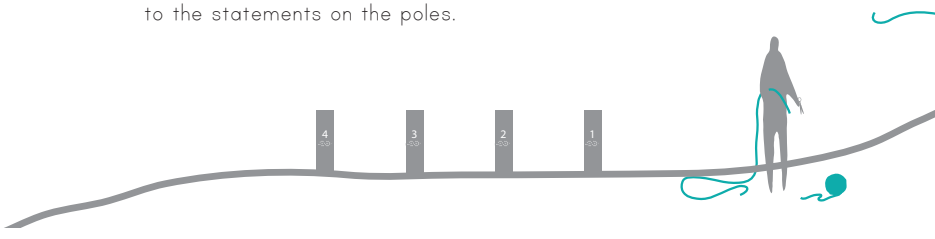
VS REALITY

HOW IT WORKS

1 The captain greets the visitors and explains the project.
The boatswain helps the captain to hand out 'tickets' with pole numbers.

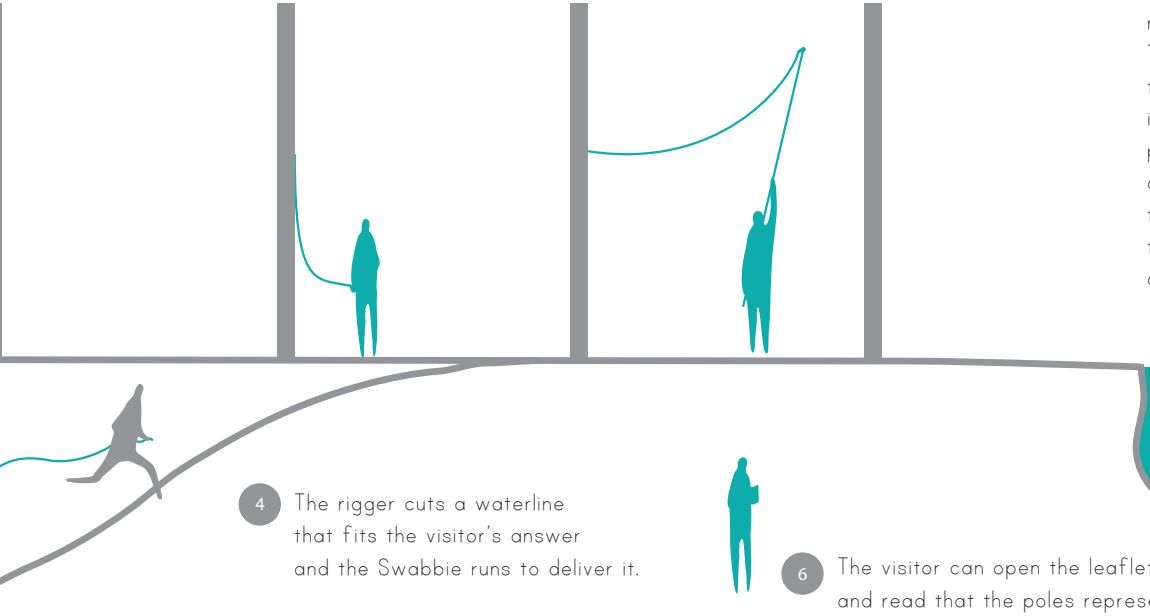
3 The navigator registers the answers and orders the personal water line for the visitor.

2 The visitor finds the assigned poles and decides if they agree or disagree to the statements on the poles.



Walking onto the vastness of the beach towards the installation, visitors are met with harsh winds and the sound of the roaring sea. They were then greeted by our team, the crew of a ship, and they become the sea makers hanging waterlines and creating the man made sea of the future. Time was a major component, the project a giant clock. Banging a gong at each hour; and thus the change of a central mast. Then blowing a whistle at each ten minute increment when the connecting mast would change. This ensured a even distribution of sea makers to masts throughout the duration of Oerol. The sea is ever prominent in the project, the project bringing awareness to the large part it would play in our future. A bell would be rung by the captain at each changing tide, and the crew bowing down to the sea, in acknowledgement of its power. The colour of the string would change with the changing tide; we were constantly commanded by the sea.

5 The visitor puts up the waterline on the hooks corresponding to their answer.



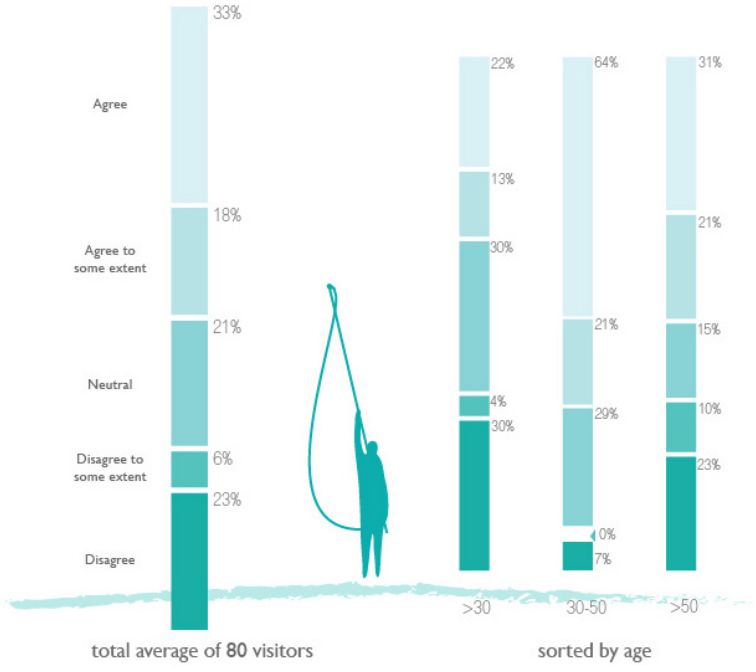
4 The rigger cuts a waterline that fits the visitor's answer and the Swabbie runs to deliver it.

6 The visitor can open the leaflet and read that the poles represent a sea-level rise of 6m.

DATA OUTCOMES

Foresea is initially made to give Oerol visitors an opportunity to experience the rising sea level in a new way and to provoke a discussion about this topic. Asking the students of the faculty of architecture to guess how high the sea level would be in 50, 100 or 200 years, evoked questions from the interviewed students as: 'Where does all the water come from?', 'Is the sea already rising?' and 'Can we still stop the rise?'. These questions and remarks made us realise that there is not a lot of knowledge when it comes to sea-level rise.

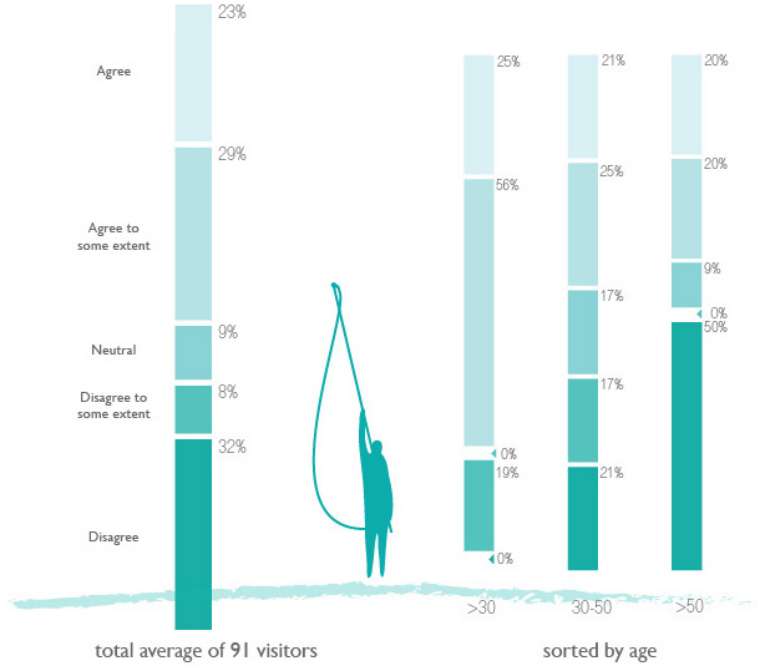
When the project developed, the interactive part of Foresea gave us opportunities to collect data according to the visitors' awareness about sea-level rise. By hanging up the waterlines at a certain height, visitors gave their opinion on the statements connecting to the poles. The sea of opinions kept on growing during the festival. People could immediately see the opinions from the previous visitors and could add their own. To have a good overview of the data in the end, we decided to write down the visitors' opinions according to the statements together with some personal information. We collected data out of more than 2300 visitors. The data is presented in graphs. A selection of the statements is presented in this chapter with a small reflection and comments from visitors. All the other statements can be found in the appendix.



1E. Carbon dioxide must be rationed per person.
responded by 80 people

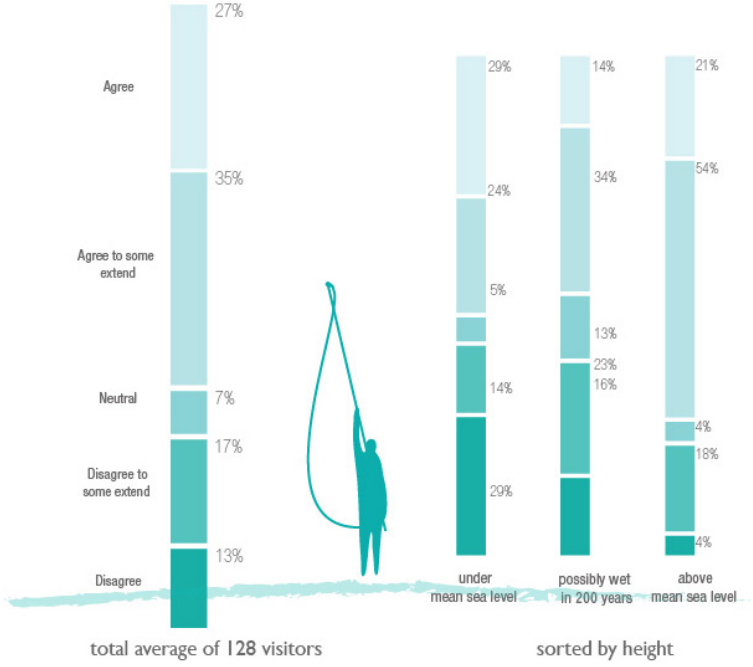
The average world citizen adds 4.9 metric tons/capita each year whereas the average Dutch person adds 6.7 Metric tons/capita per year. The difference corresponds to flying back and forth to New York three times in one year. To the idea that the emissioned carbon dioxide should be rationed per person, the Oerol visitor responded diverse. The younger visitors are less positive about this idea than the middle aged (30-50) visitors.

(The World Bank, 2011)



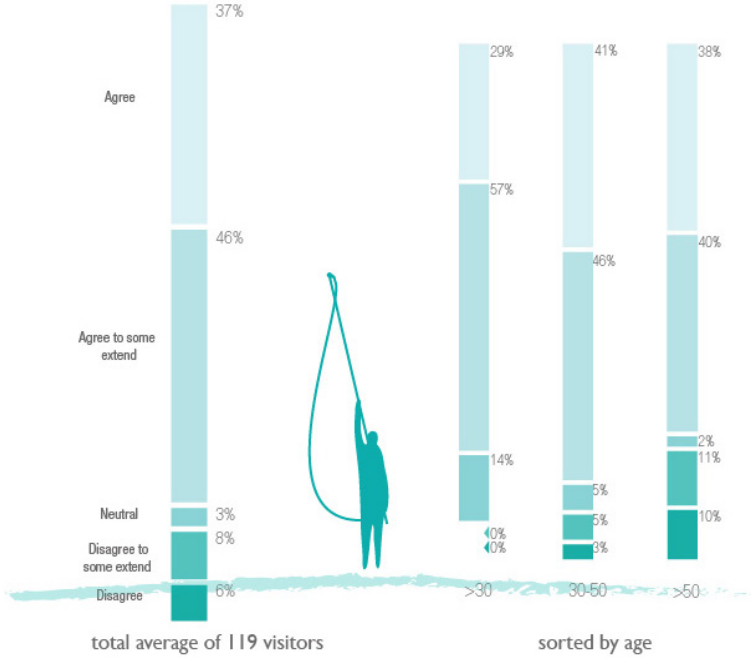
1H. Countries that emit the most greenhouse gases (CO2, Methane, etc.) must accommodate most of the climate refugees
responded by 91 people

To the idea that countries with a high emission should accommodate climate refugees, the Oerol visitors' average response was neutral. Young visitors had a much more positive opinion towards this statement than the middle aged visitors and far more than the elderly visitors. The visitors disagreeing also had different reasons to do so. Some argued that the refugees should be able to choose themselves where to live, others where disagreeing because they thought countries should decide themselves how many refugees to accept.



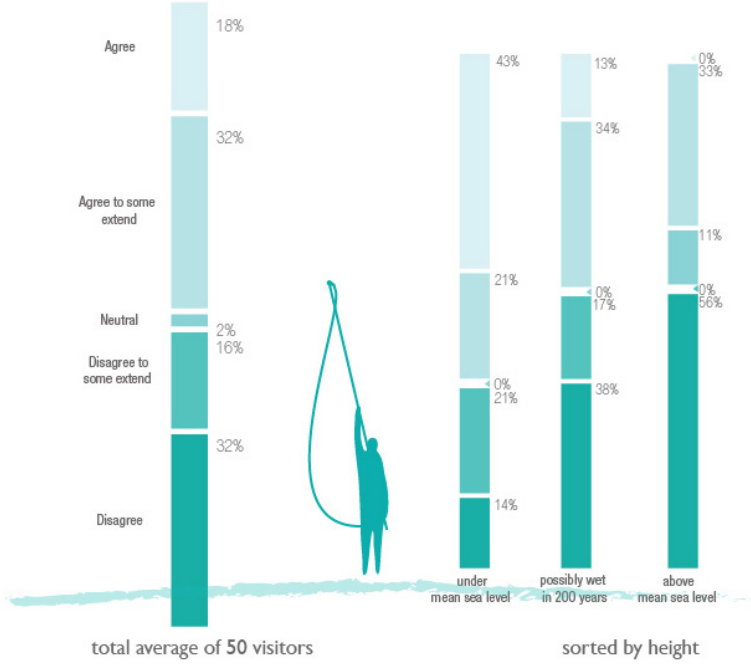
3H. I often worry about future sea-level rise.
responded by 128 people

More than 60% of the Oerol visitors, often worry about future sea-level rise. The elder visitors worry more about the rising sea than the younger visitors. Looking at the height where people live, surprisingly visitors living on higher grounds are more worried than visitors living below sea level. Did the worried people move to higher ground to be protected?



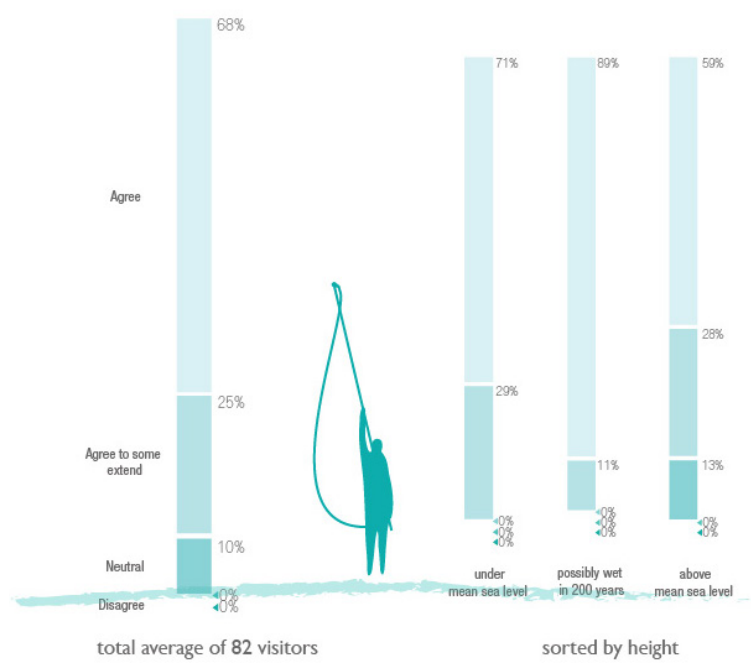
4J. I must be doing more to combat the problems of sea-level rise.
responded by 119 people

The Oerol visitor doesn't do enough to combat the problems of sea-level rise, according to their own judgement.
'So, friends, we have to change our lifestyles. Let's come up now with an idea how we could combat sea-level rise. I won't put on my heater until October, what about you?'
'I think I already do a lot to combat climate change'. 'And what about the avocado's you eat every day, they have to be sailed all the way from South-America with big and dirty cargo ships, just so you can eat an avocado'



6B. If I were to buy a house I consider its height above sea level as a factor that affects my decision.
responded by 50 people

For many visitors, a house above sea level will not be crucial while buying a new house. It is striking that visitors living below sea level are more likely to consider the height above sea level while buying a new house. They might be more aware about the place they live in relation to the visitors living above NAP.
'I just bought a new house. Is it really stupid that I didn't think about the height of the house towards NAP?'



6H. When will sea-level rise affect us?
responded by 82 people

More than 90% of the visitors think that the sea-level rise already affects us now or will in this decade. Visitors living close to the sea or in lower parts of the Netherlands, think that this happens faster than visitors living in higher parts of the Netherlands. Maybe because the people living below sea level are living in more dangerous areas according to sea-level rise.

'Is the sea already rising?'

GUESTBOOK

"We liked it an awfully lot! Very clever project. The project has acted as a wake-up call to our consciences..."

| Anonymous

"Very interesting project! It is a wake-up call for humanity and with the course we sail now."

| Lenneke & Adriaan

"What an inspiring way to starting a discussion about this topic. It's a success.
Hopefully this will lead to an inspiring way to deal with the sea-level rise."

| Anonymous

"Super Project, we are going to buy an electric car! We thought we did better than worlds average..."

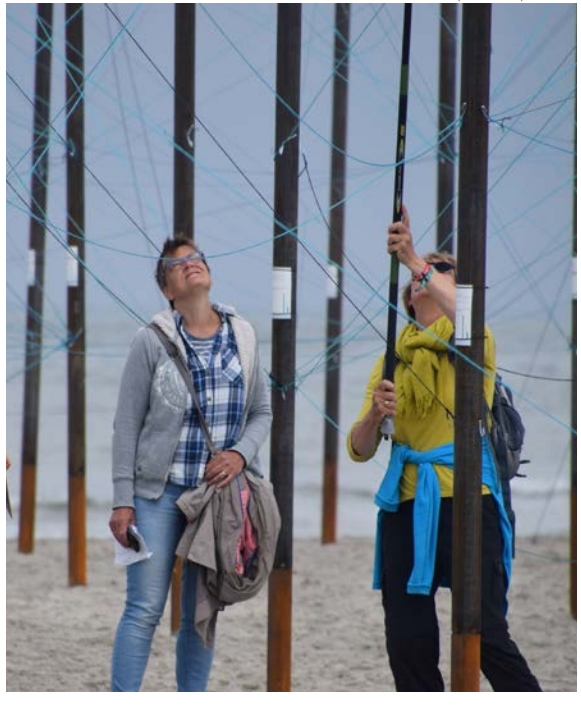
| Elisabeth

"It is nice to see that you together developed such a beautiful, good and creative form.
Awareness arises with palpability + recognizability + confrontation. Enjoy the effects and results. I enjoyed your enthusiasm.
Green Greetings"

Ria Markboort & Paul Brugman |

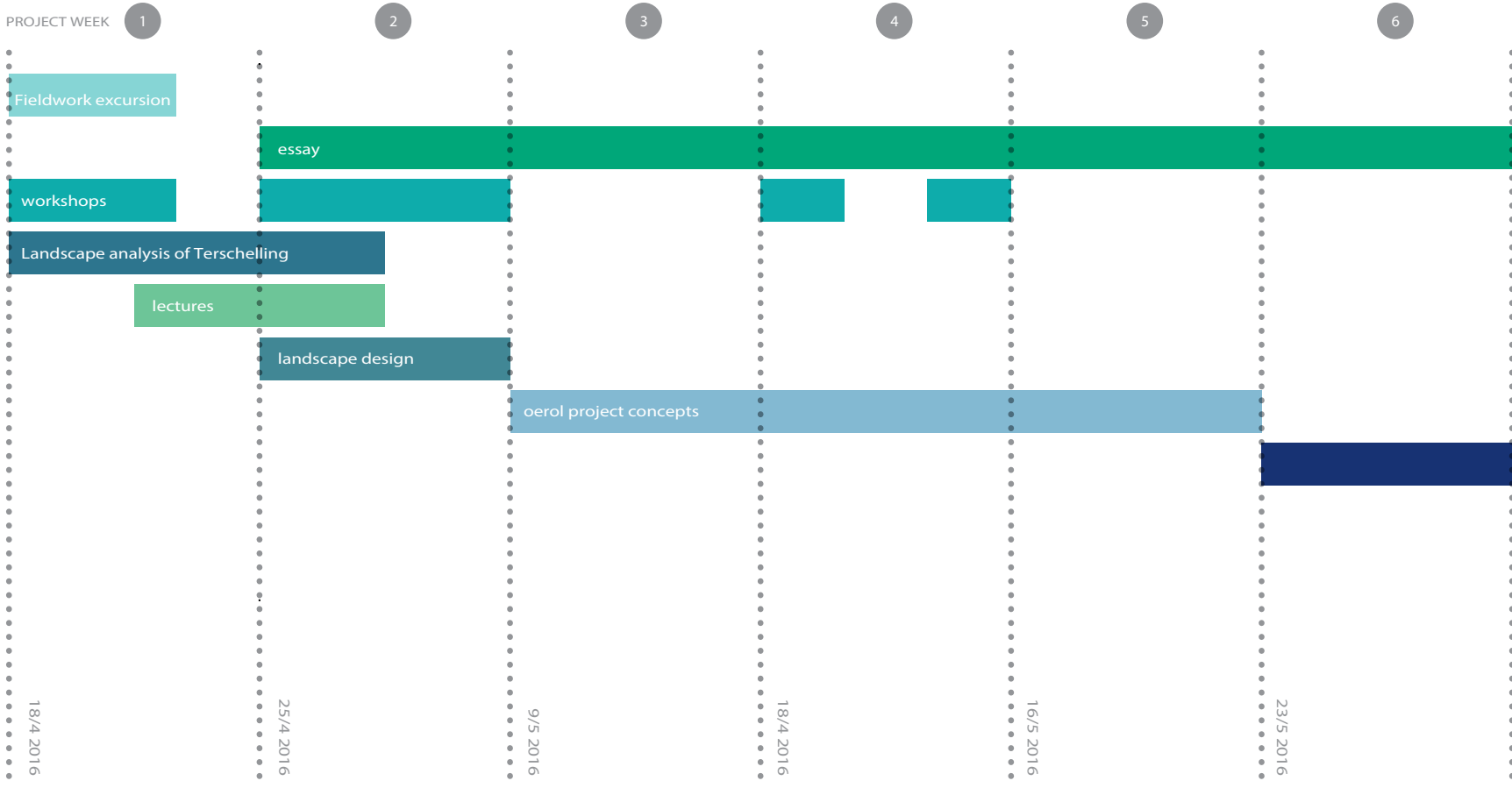
"Very nice, beautiful and good. Provoking thoughts. Which countries are developed? Which ones are nowadays part of the first world? Which second?
I had to explain a lot to my daughter that we live in a first world country but that there exist third world countries as well. Very nice, we will keep following you in the process!"

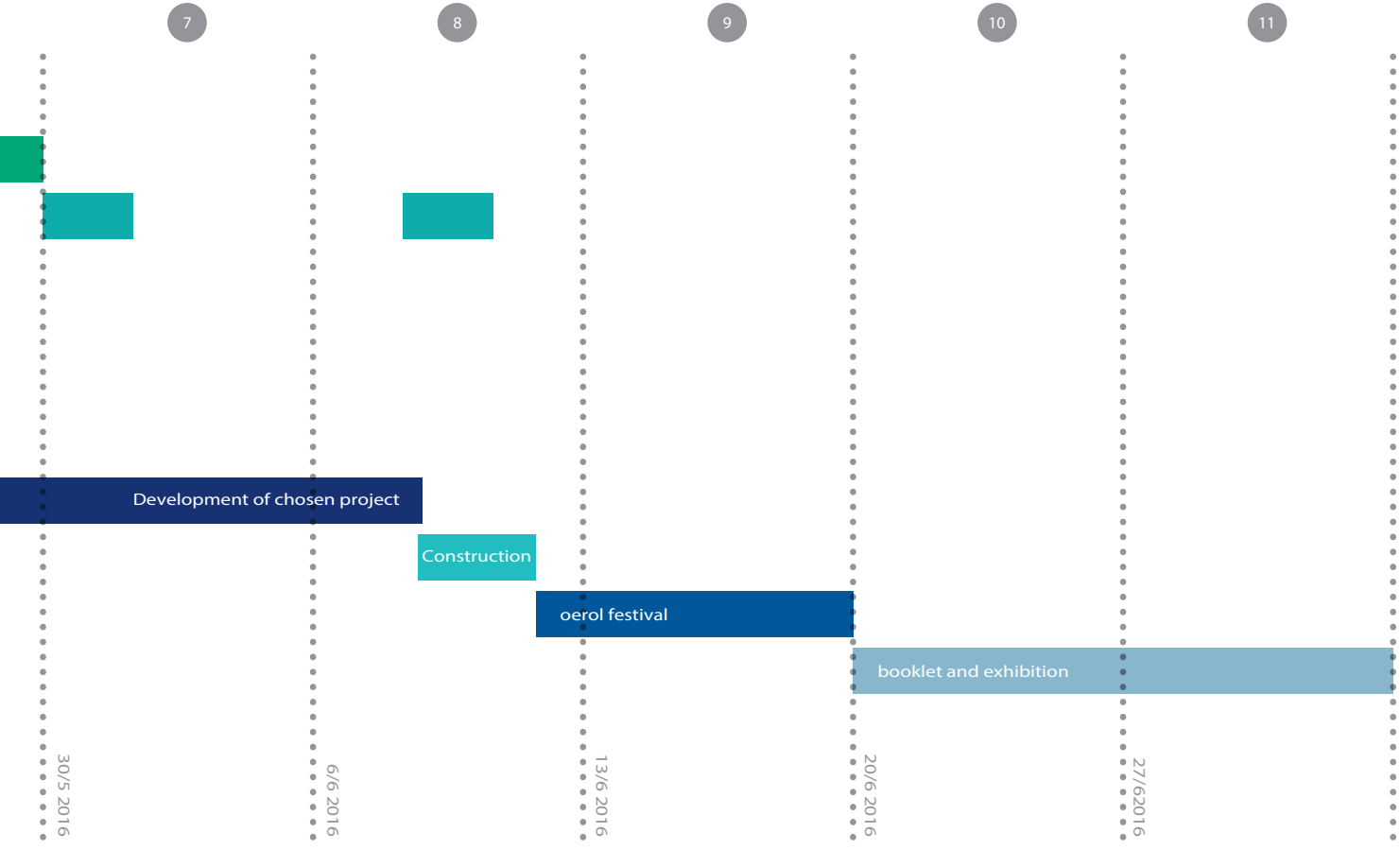
| Anonymous




THE WAY TO FORESEA

TIMELINE


PROJECT WEEK
1
2
3
4
5
6
Fieldwork excursion
essay
workshops
Landscape analysis of Terschelling
lectures
landscape design
oerol project concepts
18/4 2016
25/4 2016
9/5 2016
18/4 2016
16/5 2016
23/5 2016


7
8
9
10
11
Development of chosen project
Construction
oerol festival
booklet and exhibition
30/5 2016
6/6 2016
13/6 2016
20/6 2016
27/62016

SITE VISIT

The initial site visit was a chance to explore the atmosphere of Terschelling, and to consider its 'sense of place'. It was also a nice way for us to get to know each other, and to consider how we would work as a team.

Once we arrived on the island, we immediately got to work on recording our experience of the different landscapes on oversized canvasses. The aim was for the canvas to be our impression of the essence for each place that we travelled to. We were encouraged to get creative, outside of our usual constraints; whether that was with traditional media such as charcoal and paint, or material gathered on site such as grass, soil, sand and shells.

Within the first day we had seen many parts of the island; the marshland, in which Louis lost his shoe to the clay; the meadows, where the birds were in mating season; the pine forest, which was scattered with shells from its previous life as a dune; and the mosses, full of wild heather and tiny flowers.

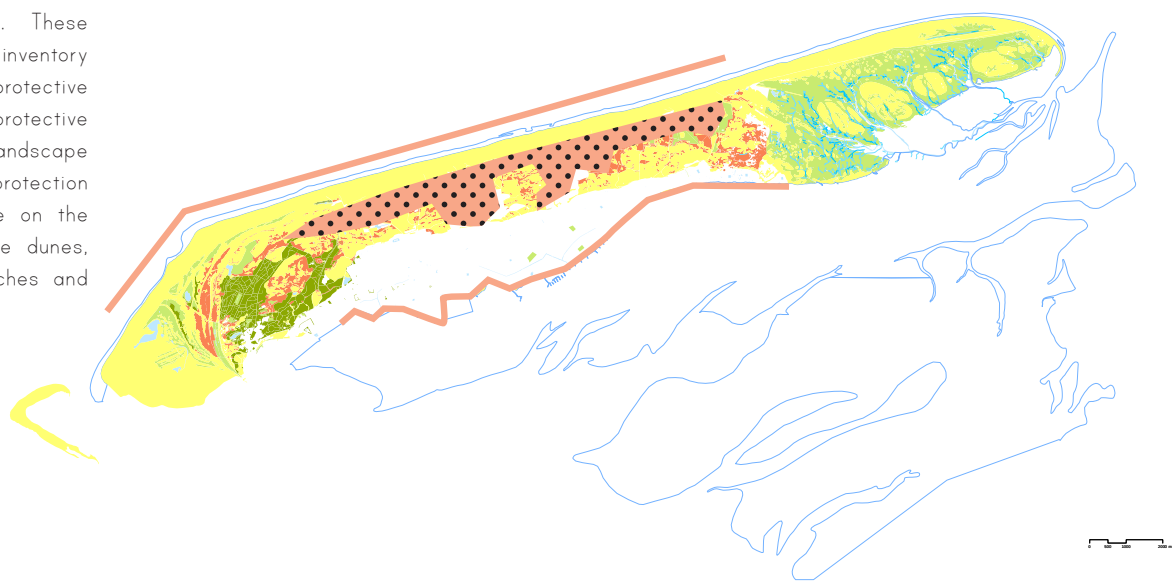
On our second day we got up early to begin another workshop, but this time about the site, and more specifically, about registering 'a line of growth or movement'. Following from the previous night's work, we tried to work with the natural processes of the land such as the motion of sand carried by the harsh wind. Others looked to the dunes, the swaying of the marram grass and its growth from green sapling to mature red.

We finished the trip with a final workshop by Maartje Keijzer on the beach. She prepared multiple exercises to help up loosen up, for example, we first had to tell a story about a special artefact that we found on the ground. Once we performed our stories, we discussed what was good about each one and also how the narrative could be strengthened. This helped us to pay more attention to the idea of identity and message, and how to engage an audience. We also did some fun exercises to build up our teamwork, such as playing a game of 'voetjes van de vloer' and rolling down the dune!

By that evening we were all quite exhausted, but we warmed up and refuelled with a comforting dinner. Later on, we prepared for a mysterious evening workshop with John Lonsdale. Deep in the forest, when dusk turned to night, John asked us to capture the moment when our vision faded and our other senses were heightened. What was the experience of the landscape when you could not see it, but only feel it? The result was intriguing - many of the canvasses shifted from pictorial representation to abstract gestures, textured reliefs and kinetic models.

SITE ANALYSIS

The island of Terschelling consists of multiple landscape types. These landscapes are described in this inventory as urban, cultural, coastal protective and natural landscapes. The protective landscapes are defined as landscape constructed by man for coastal protection eg. planting of grass and pine on the beaches to create and stabilize dunes, sand motors nurturing the beaches and dikes to prevent flooding.



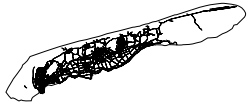
The natural landscapes and the transition to coastal protection landscapes.

- The beach
- The heather
- The birch forest
- Water/marshland
- Coastal line
- Transition zone from natural to protected

THE URBAN LANDSCAPE

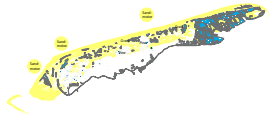
Buildings: a series of linear villages runs through the island

Roads and footpaths: connect the villages but also the coastal lines

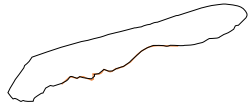


THE PROTECTIVE LANDSCAPE

Sand motors: nurture the beaches
Grass and pine: planted to create and stabilise dunes



Dikes: protect the island from flooding

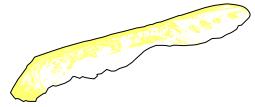


Pine forest: prevents erosion and movement of dunes

THE NATURAL LANDSCAPE

The coastal line with the salt marshland in the east

The beaches predominantly situated in the north



The forests of pine and birch

THE CULTURAL LANDSCAPE

Water structures: ditches and canals

The polder

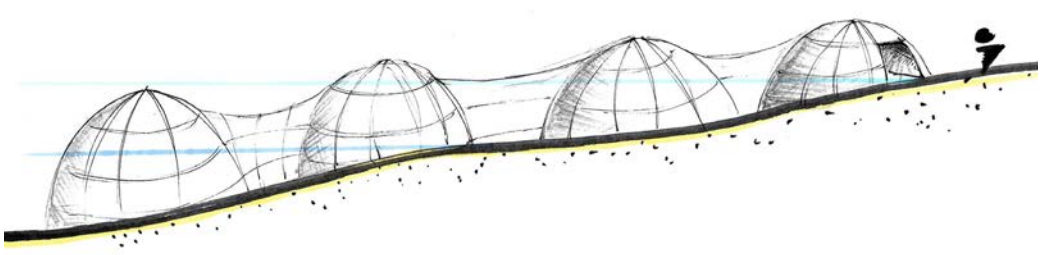
LANDSCAPE PLANS

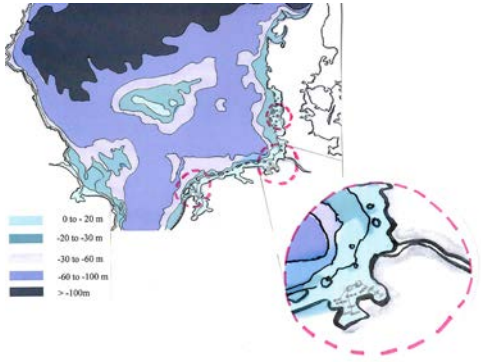
The analysis of site looked at both the small and larger scale; noting past interventions in the environment and present identity. Through brainstorming we also predicted potential future scenarios on Terschelling. We used these ideas to develop individual landscape plans; some as potential implementations for the future, some purely to provoke discussion on what the future may hold. The individual plans are on the following pages.

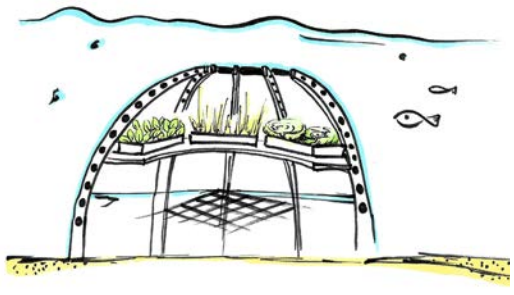
F(L)OOD

F(l)OOD is a project based on offshore agriculture where crops will grow under the water table. Under water a preferable environment can be created with a stable temperature, enough light and no factors that can endanger the crops. The salt water evaporates and condenses on the ceiling, which results in closed cycle of fresh water precipitation.

The world's population is growing and developing. If we go on consuming like we do now we need two globes in 2050 to feed all of us. But how to expand? The earth exists for 70% of water. If extension on land isn't possible we need an innovation where we grow crops in the ocean!







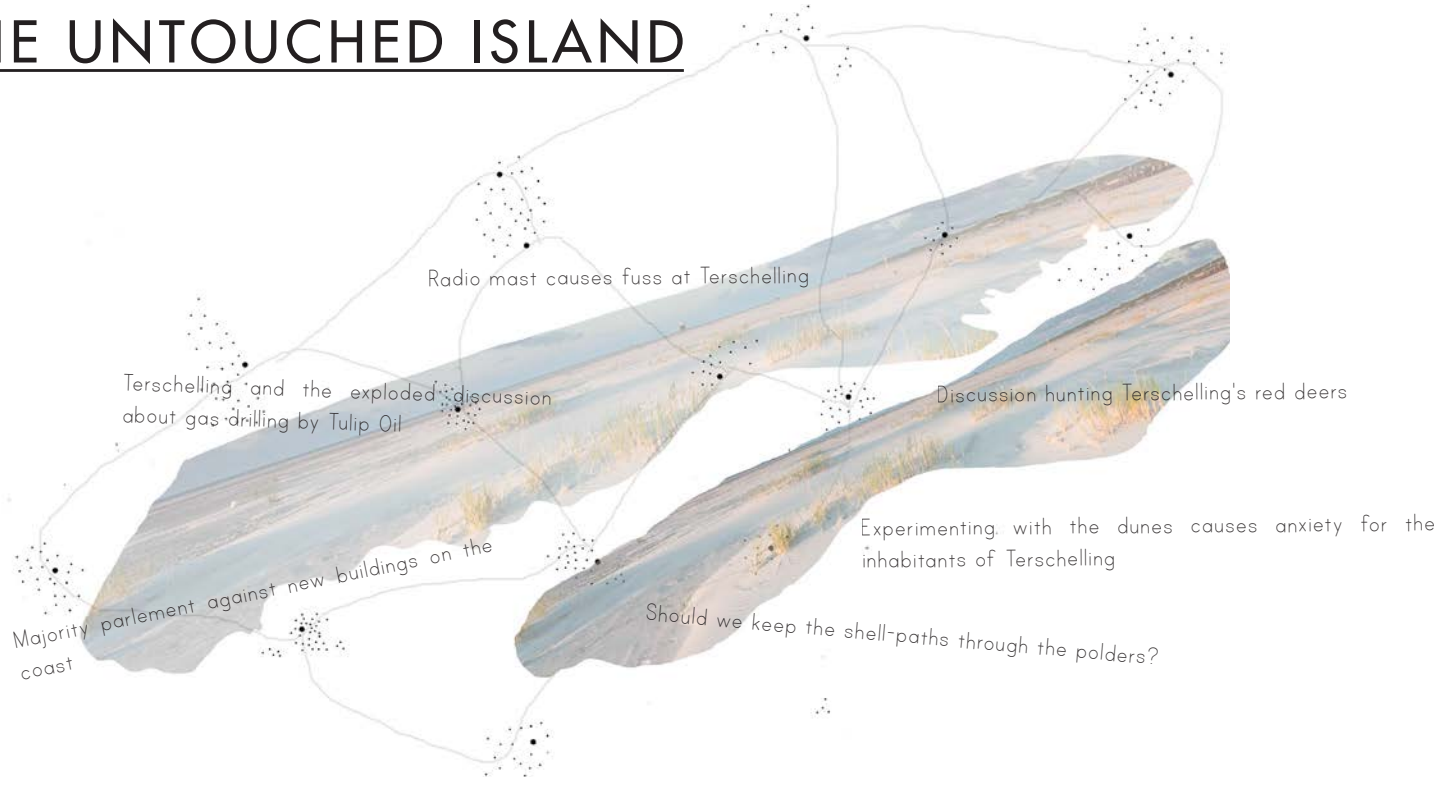
THE SANDMOTOR OF THE WADDENSEA AREA

The Wadden sea islands are slowly moving by erosion. With human interventions we try to prevent this, but this requires a lot of maintenance.

How to make a permanent intervention in the Wadden Sea area that prevents the island from eroding?

The flow of the water can be used when looking at the sand desposition. From the sandbank the sand firstly is deposit onto the island after which it's transported by the sea up to Denmark. The sand is moved in the upper layer of the sea. When adding a sand collector in the layer of water the sand can be taken out of this upward stream. The sand can then be reused by adding it on the sandbank again. In this way the sandbank is an endless protector for the islands.

THE UNTOUCHED ISLAND



How can we en joy life without disturbing nature?

Many opinions about how we have to deal with nature and how much we have to intervene in it leaded to an extreme landscape design, in which nature won't be touched by humans. In this future plan, people from the island of Terschelling will live in clustered cities on the water and nature will take over again on the island.

HOW CAN THE BEACH OF TERSCHELLING DEAL WITH THE FORCES OF TOURISM?

How to plan tourist housing, while respecting the landscape?

- No dependence on agriculture anymore
- Let the villages grow towards each other
- Transform the polders into leisure areas
- Protect the dunes, kwelders and heather
- Use the pine forest as building material
- Assign one place on the beach for leisure

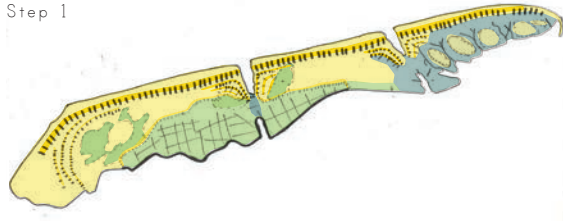
The beach of Terschelling stands out from most of the other beaches in the Netherlands, its vast open space makes it flexible in use and pleasant when combining functions. In an age where people were desperate for some leisure time, the coast was the place they were looking for. But the high density of people makes you forget the landscape. By showing the harsh contrast between 'beach life' and the landscape, people will notice something and start asking questions...

Where are we now?

The value of the rich diversity of islands cannot be overstated, but neither should it be taken for granted. One of the many threats faced by these islands is tourism. But tourism can take many forms, so it is a question of ensuring that the type of tourist activities is in harmony with the particular character of the island or archipelago.

SUSTAINABLE WADDEN SEA ISLANDS

Two main threats: the need to heighten the dunes because of sea-level rise and running out of oil and other energy resources. The natural and dynamic grow of the dunes will be restored by regenerating old washovers. By doing this, the island Terschelling will be seperated in three parts; a residential area, an area for laboratory and (new) energy resources to make the island energy self-sufficient and at the tail there is free space for nature.

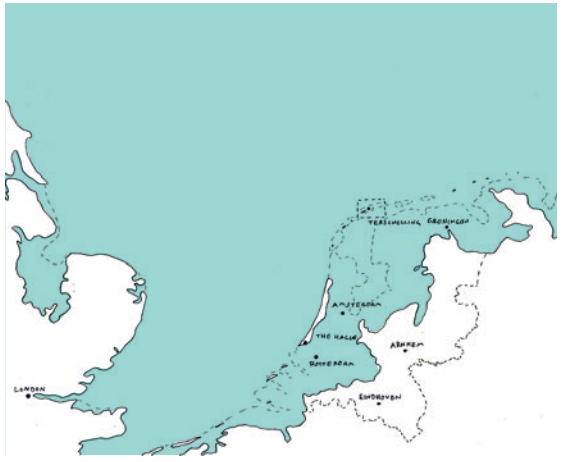


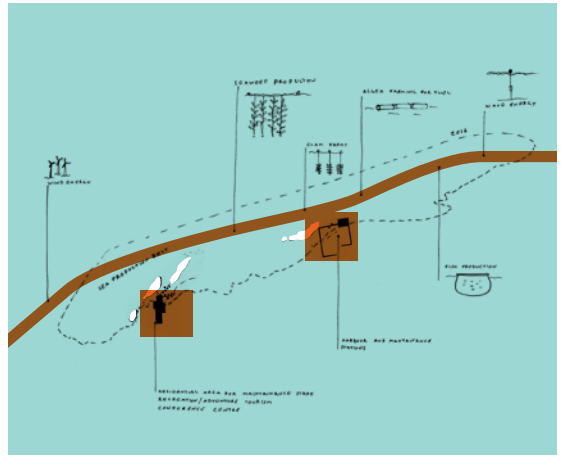
TERSCHELLING 2200

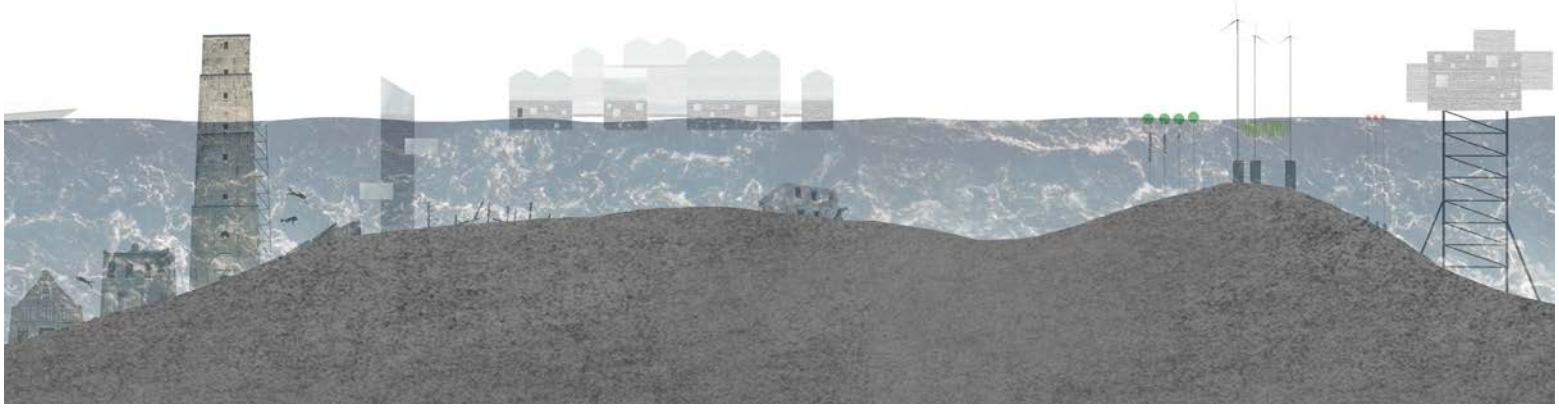
SEA LEVEL HAS RISEN 6M DUE TO CLIMATE CHANGE

How do we deal with this new sea landscape? What possibilities arise and what are the challenges? Many questions arise.

This scenario focuses on offshore energy and food production and how we could build sustainable cities in the water landscape. Along what used to be the coast of the Netherlands a ribbon of offshore industries has been created with sea villages to house the workers of the area. Zooming in on Terschelling different types of production is located over the flooded island.



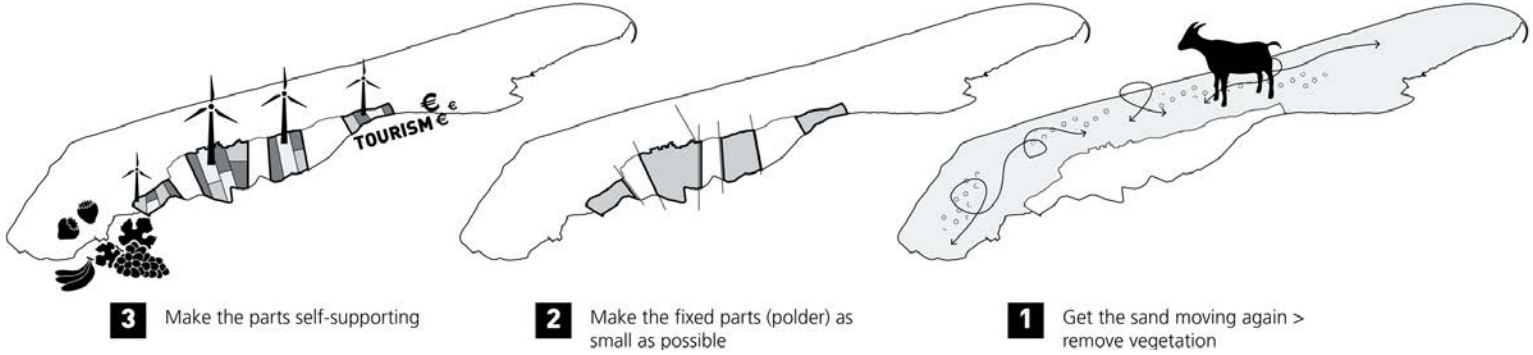




A WALKING ISLAND

This landscape plan explores the option of making Terschelling a dynamic and self-supporting island again. The concept exists basically out of three steps:
1. Remove vegetation to get Terschelling moving again;
2. Cut the polder into pieces to make the fixed part of the island as small as possible;
3. Make every piece of the polder a self-supporting cell.

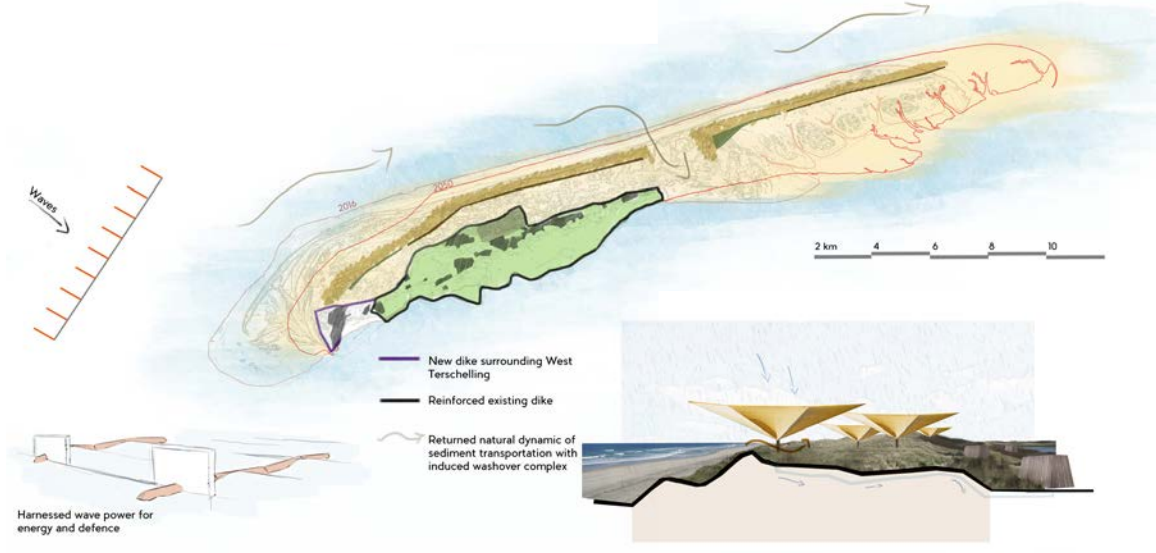
The result of this is a main island body that can freely move with the dynamics. And several small, fixed, self-supporting communities connected to this main (moving) island.



NATURAL TERSCHELLING

Reinforced stabilisation

Restoration of natural dynamic



The landscape plan aims to restore the natural dynamic of the island whilst ensuring the islands identity remains. Terschelling is noted for its 'natural' beauty within five varying landscapes; pine forests, marshlands, dunes, beach and polders. The dike will be reinforced to protect the forest, polders and settlements. Other human interventions will be removed to induce the natural dynamic again across the beach, dunes and marshland. The washover complex will be reintroduced which will encourage this movement.

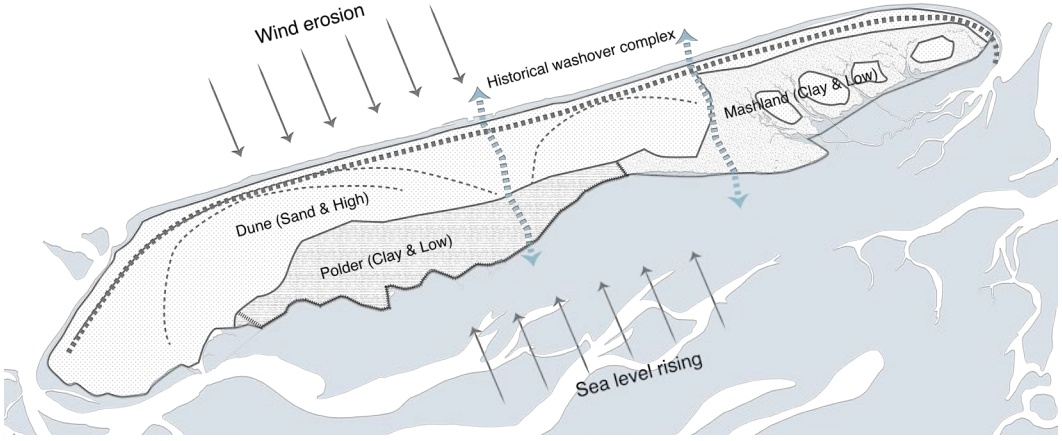
Past manipulations to stabilise the island came in adding vegetation to the dunes, limiting sediment travel. In the future of climate change and probable increased rainfall, the man created vegetation will keep stabilising the dunes, limiting the restoration of natural movement on the island. The idea to create unfolding rain collecting systems on the dunes would collect the rain and limit nourishment to the vegetation, restoring the intervention of addition vegetation. This rainwater could then be used for holiday homes throughout the island.

DYNAMIC LIVING

The key word for our plan is "dynamic". It is both the challenge and opportunity for the island. The residential areas on the island are protected by the dune in the north and the dike in the south. But the dune is eroded by wind gradually, and the dike is threatened by the rising sea level. If nothing will be done, the polder will either be covered by sands or flooded by sea. However, if we open the dune and dike, let the natural process take over, the polder will be heightened by sand and clay automaticaly. At the same time, it will add bio diversity and recreational value on the island.

Thus, searching for a new way of living adapting to the dynamic natural process becomes the strategy.

Problematic

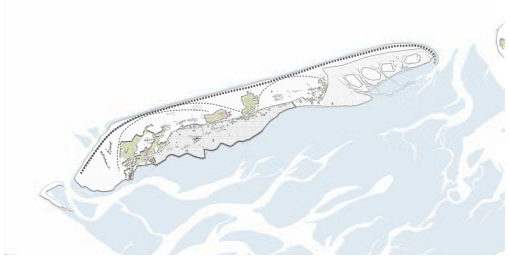


According to the erosion map and height map, the relatively safe area in the dune is found for the new residence. The residents will be completely moved into the dune houses by 2036.

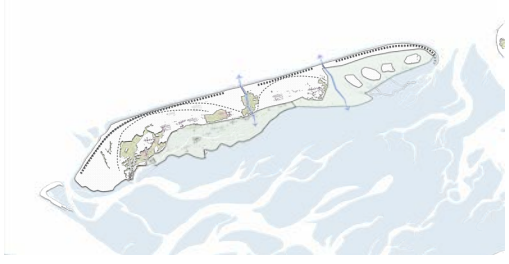
After that, the dune and dike will be opened at the location of the former wash over complex. The dynamic system is re-established. The old village will degrade into ruins, while the old dike becomes a splendid route with marshland on both sides.

100 years after that, the marshland will grow to a certain height which won't be threated by sand and sea. Then the residents could come back and reclaim the rich land.

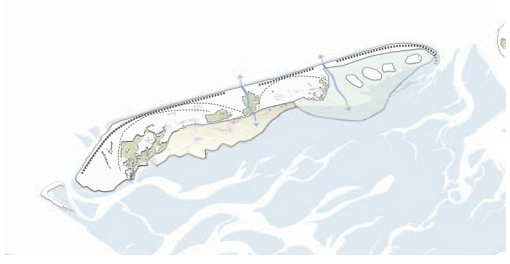
Dune house in 2026



Open dune in 2036

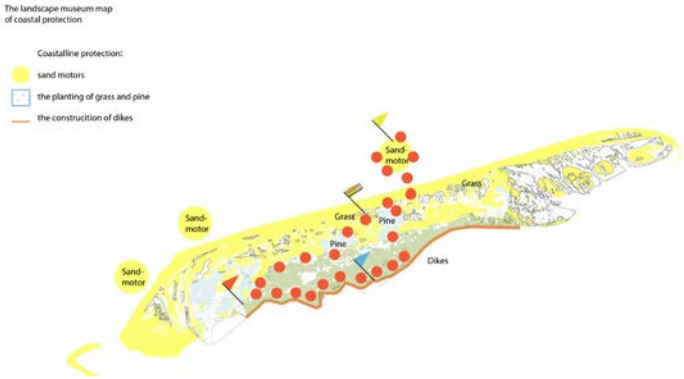


Move back in 2136



LANDSCAPE AS MUSEUM

The landscape plan derives from the idea that what is perceived as a natural landscape on Terschelling consists of a variety of landscapes e.g. coastal protection, urban landscapes, cultural landscapes and of course also natural landscapes (see site analysis). The area that overlaps the different landscapes have been defined in this plan. By highlighting these areas with installations and artworks that define and enhance the breakpoints in the landscape these areas could become attraction points for visitors. A museum of landscapes.

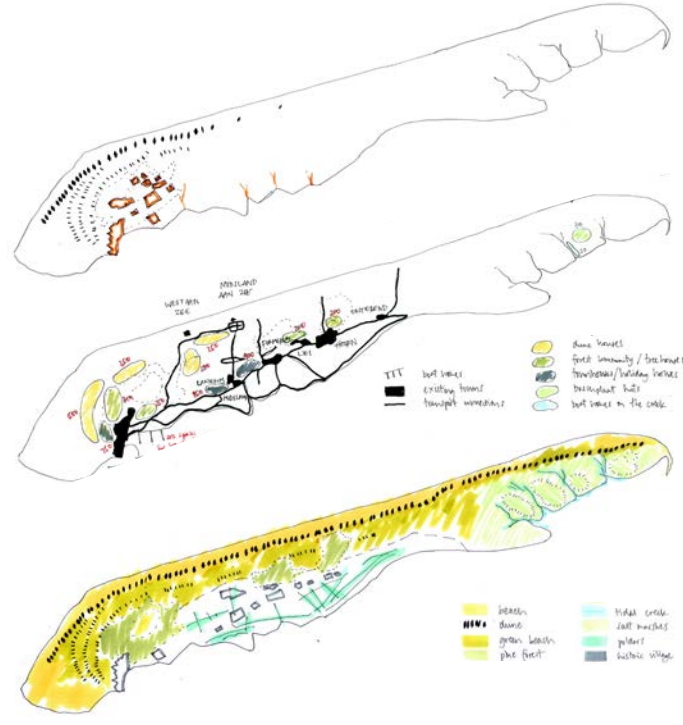


HOLIDAY HOME TAKEOVER

DEALING WITH ECONOMIC FORCES ON THE COAST

In an imaginary future scenario, the coastal dunes to the east are gradually broken down to stimulate natural dynamic processes, while the islanders' relocate to higher land in the east. The wilderness flourishes so much that Terschellings landscape becomes a major destination. There is then an unpredecented economic demand for 5,000 holiday homes on the island. How could such a situation be dealt with in a way that also maintains the dynamics of a barrier island? Could it be an opportunity for innovative living environments while protecting bio diversity?

Upper: surburban style housing supported by existing towns
Second from top: creekside huts for scientists and researchers to study the experiment of making the island dynamic again
Third from top: Semi-dense housing clusters in the dunes
Bottom: treetop houses in the forest



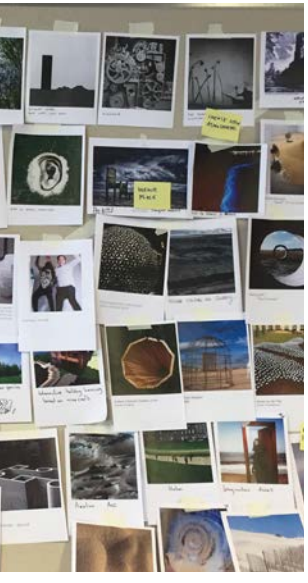
Top: Diverse landscapes of Terschelling
Centre: Potential locations for new holiday homes
Bottom: the existing footprint of towns could theoretically fit on the east side on the island with ease

BRAINSTROM SESSIONS

Post-it brainstorm

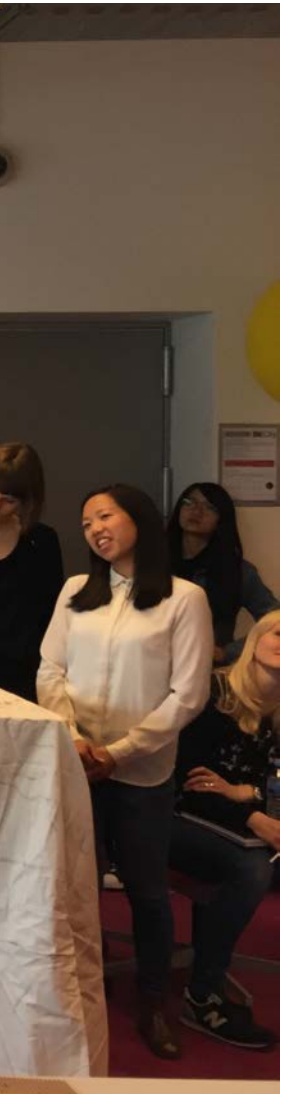

Inspiration moodboard

Working hard with the team



Idea presentations and critique

THE 6 PROJECT OPTIONS



The reality of having to build a physical design on site in only a short matter of weeks was quickly becoming apparent. Coming together as a team, after our individual research of the island, we began the generation of designs and concepts for the installation.

More than just sitting and 'designing' we created intensive design schedules for the group. We challenged ourselves to brainstorm ideas together with a constant process of grouping concepts and re-framing; a continuous process of expanding ideas and pushing them into bigger concepts.

The main method the team used was brainstorming; but encouraging movement in ourselves during the process. By using post-it notes and quickly writing any ideas in our heads and placing them on the note; these could be sticked on the walls surrounding us. Then others could pick these up, regroup the ideas into a bigger concept, re-define it and expand the idea. Our design sessions always had lots of energy and movement which resulted in a huge number of ideas. The arduous process pushed us into unexpected territories for outcomes we did not expect.

When more solid ideas were becoming apparent, the team started a process of splitting into smaller groups for a specific idea. Again these ideas would be evaluated, expanded and picked up by other members of the group. Thus all ideas had potential of contribution from all team members, and we could develop ideas individually or in large groups. In this way, we could all explore several themes through the course, and all themes could be expanded to their potential.

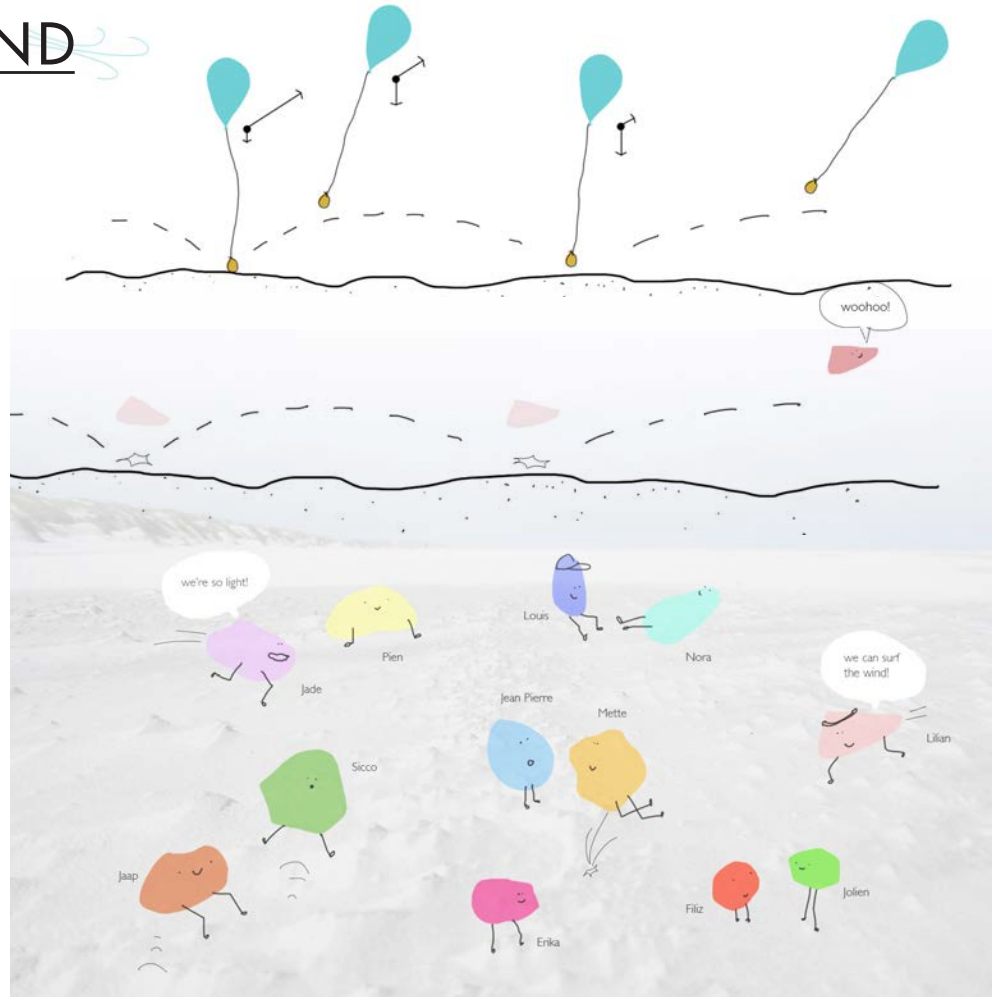
The final week in the design stage had six main concepts. Each member of the team chose one they wanted to develop. The six were worked on and displayed at the mid-term presentation which saw the ideas in more detail. The exciting event had a panel of outside guests from previous Oerol projects; outside teachers and faculty tutors. With a great enthusiasm from the team, all presentations were a great success. But only one could be chosen. The team developed a evaluation criteria to evaluate design ideas, matching objectives the team as a whole felt was important.

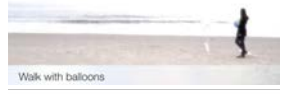
Thus, Foresea was chosen to continue into materialisation at Oerol 2016.

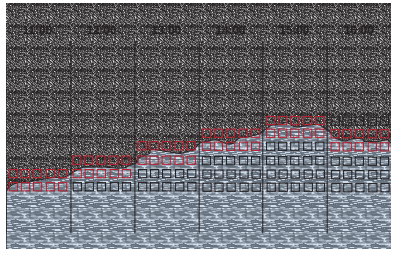
BALLOONS: TRACING THE LIGHTNESS OF SAND

Our first impression of the site was about the dramatic forces of nature. We were especially taken by the blowing movement of the sand; its playfulness and lightness, and the way it danced on the wind. Each sand grain looked at if it had a character of its own!

This bouncing motion of the sand was also beautiful to watch, and so we recreated its journey using a coloured balloon and weighted with a bag of sand. The wind would pick up the balloon and gently guide it along with the sand. From this, we designed a project where we play a game with the visitors, who can follow the path of a grain and thus experience the lightness of being.







The game

Groups of 5 visitors each adopt a balloon and are given a clipboard. They choose how much sand to use as a weight, and then together they must chase the balloon across the tidal line, and trace its path. This creates a playful interaction between wind, sea, sand and people.

The drawing

The end product is a combined drawing of the visitors' interactions. It registers both the natural process and movement of the sand, and a memory of the moments our visitors share with each other. The drawings also show the different sensitivies of each person.

The tide

There are 10 of these games happening at once along the tide. As the tide comes in, we retreat our game area with it, but the previous balloons remain as coloured dots in the sea. By the end of the day we will have an impressive display of balloons swaying in the wind and sea.

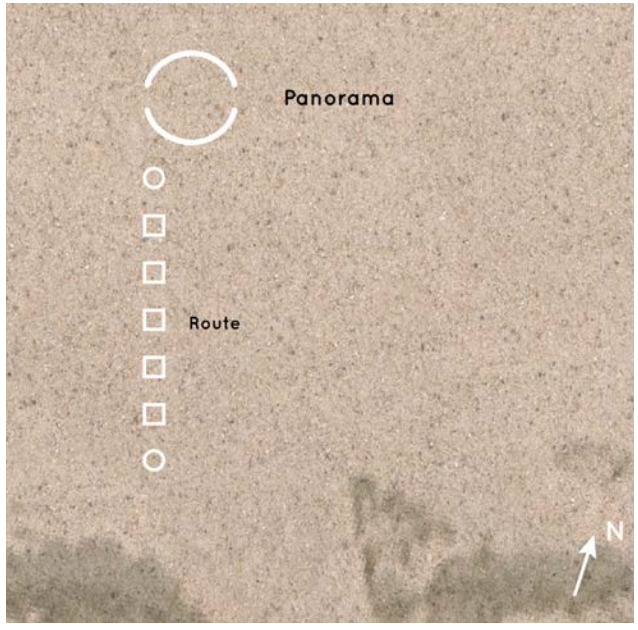
Experiments

We experimented with different options for the structure of the game and the people we tested it on enjoyed taking part.

TIDELINE

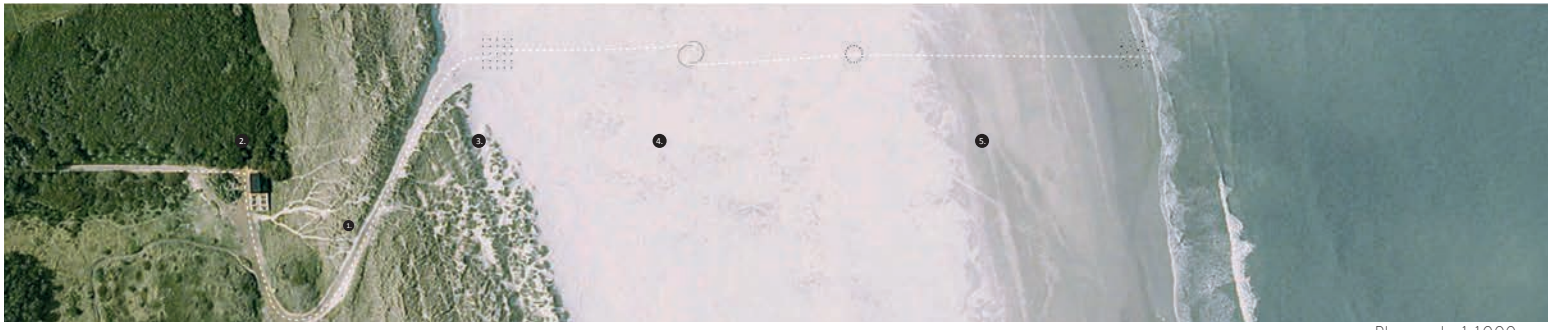
With the visualisation of the past tideline, visitors could see not only their present surrounding but the natural system on a bigger whole. The concept of the project got visitors to decorate their canvas of their sensory experience of the landscape. With a particular colour, dependent on their time of arrival, visitors placed their own recording of landscape on the waterline and thus become part of the whole, clocking the moving system of the tides.

PANORAMA TERSCHELLING

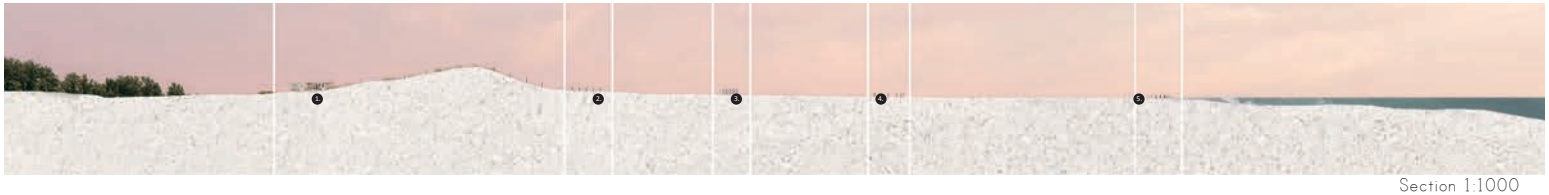


The goal of the project Panorama Terschelling is to confront people with the tension between their wishes and needs. This will be achieved by showing the consequences of economic pressure on the coast in an interactive panorama. The visitors create a visual panorama by adding or removing for example beach houses or oil platforms, their behavior in real life influences the image of the landscape.

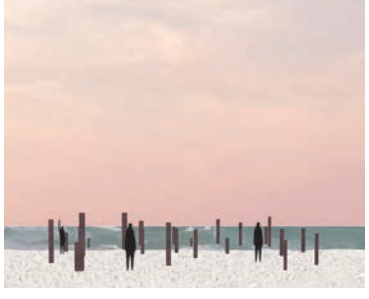
WINDHARPS

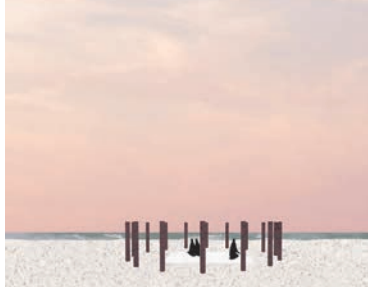


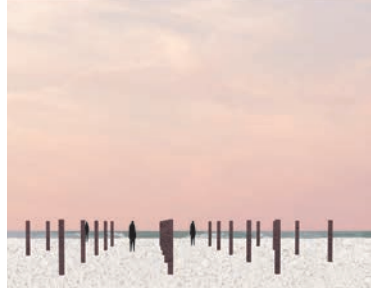
Plan scale 1:1000

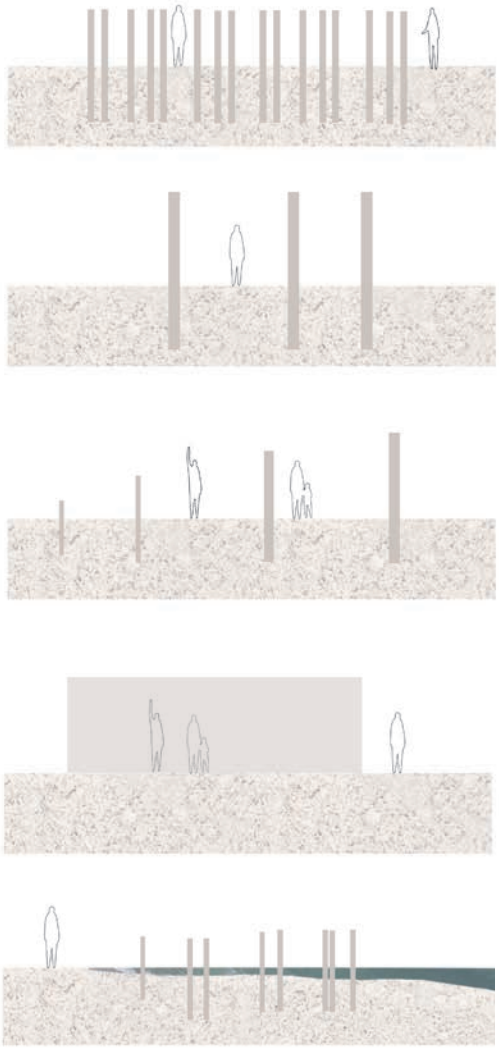


Section 1:1000



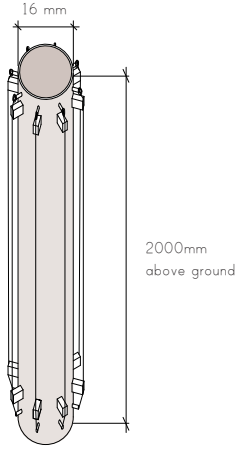


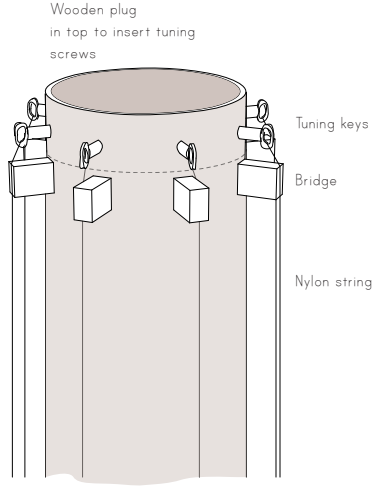


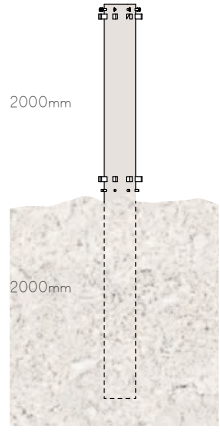


This project for Oerol festival is about creating different emotions through wind generated sounds. The sounds produced by wind instruments vary depending on the amount of wind and the shape and quantity of instruments. The instrument proposed is a windharp made out of a tube on which strings are attached. The vibration of these strings created by the wind give a specific sound. The pitch of the sounds is depending on the length of the string. The longer the string, the higher the tone.

The project lets people walk from the beach pavilion across the dunes, over the beach towards the sea. During this walk instruments are organized in different ways, producing different types of sound. The way the instruments are arranged is depending on the emotion we would like to provoke in visitors. In this way we would like to make visitors more aware of the feelings they experience in this specific landscape.







HUMAN DUNE | NATURAL RUIN

The project addresses the conflict between nature and humanity specified on the island of Terschelling and aims to provoke a discussion on this theme. Terschelling used to be a dynamic moving barrier island until humans came to inhabit around 1000 AD. By planting grass and trees and building dikes they protected their villages against the sea but also disrupted the dynamic processes on the island.

The installation tries show on the one hand what would happen if the island was made dynamic again and moved south-east until the moment when the ruins of the old villages would appear on the beach; and on the other hand show the artificiality of the dunes and their role as protectors but disrupters of natural processes. Therefore visitors would choose between building either a 'human dune' or a 'natural ruin' on the beach using the material present and writing their motive for their decision in the construction. This would create a growing dune-ruin installation which embodies the discussion on the dynamics of the island and its maintenance.

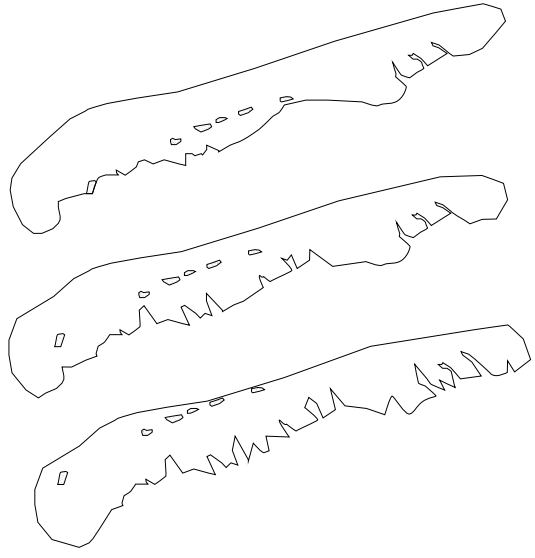
GOAL

Dynamic landscape

Provoke a discussion on the maintenance of the landscape

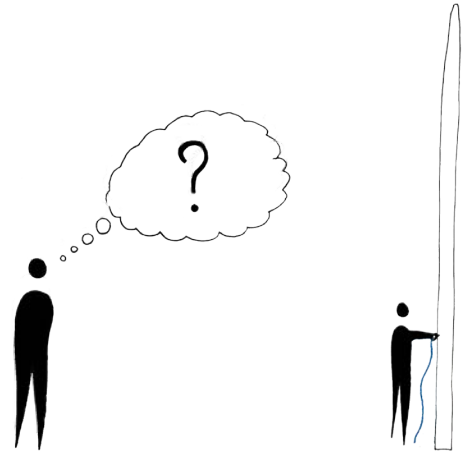
Static landscape

The moving island



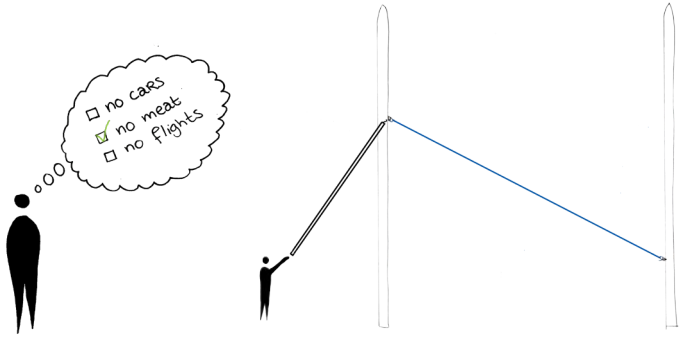
FORESEA THE FUTURE

How much will the sea-level rise in the future? Due to what? Can we, as individuals, collaborate to reduce this rise? Which technologies are being developed to reduce sea-level rise? Which steps have allready been taken? And how critical is this rise? Can we turn it into something postive?
Is it possible to forsea the future?

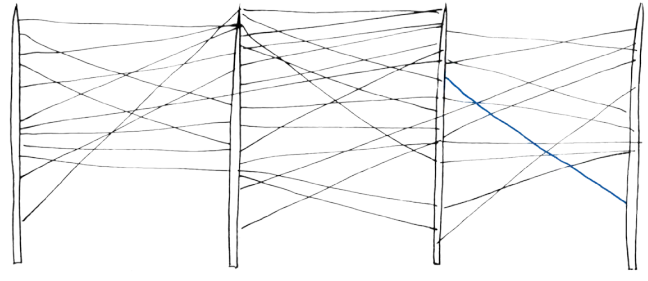


1) Make visitor think about the sea-level rise in 200 years and let him register it

2) Tell visitor what the expectations are



3) Show visitor which actions influence sea-level rise and let him register influence of his behavior



4) Visitors' data is part of bigger registration

DEVELOPMENT OF FORESEA

In this chapter we will explain the making of Foresea; from voting on our design options to the construction of the project.

Our first act was to divide ourselves into specific roles and sub-teams to focus on separate tasks. The smaller teams would help us to be more effective in making decisions, and for us to take responsibility of different aspects of the process.

Project manager: Main task - controlling the overall efforts of the group. Secondary task - supporting Research team and Finance

Finance and Logistics: Checking the feasibility, costs and logistics of various construction methods, as well as the team's project costs.

Research: Thorough investigation on the theoretical basis of the concept - that sea levels will rise to 6m above NAP in 2200.

Design and Construction: Refining and strengthening the initial concept and experimenting with different form expression - size, proportion, material, aesthetic. Developing options for different modes of construction sequence.

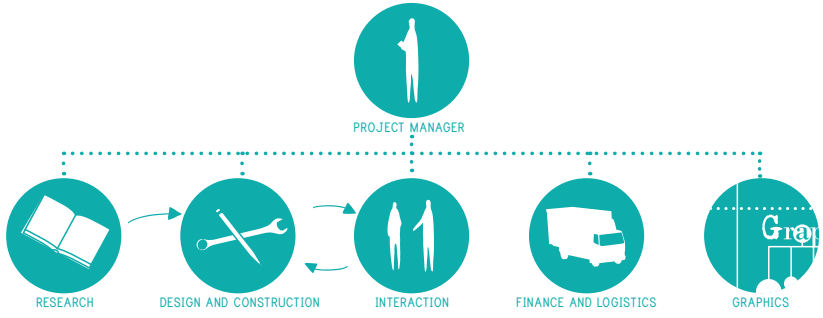
Interaction: Elaborating on the performative and research element of the project - the involvement of the visitors, the focus of the our message, and the roles that we play during the festival

Graphics and PR: Development of a unifying graphic and aesthetic for the project. Publicising the group's work via the website, within the faculty, and on social media. Preparing the foundations for this booklet you are currently reading.

Over the course of the development process, these roles invariably adapted and expanded, since the work of each sub-team was interdependent. Checking the feasibility of making such a large-scale project was especially difficult for a group of students with little real experience in construction. For example, the choice of materials was dependent on many factors and the design was not necessarily set. How could we calculate the costs of each option when none of them were really defined?

Questions such as these were sometimes difficult to resolve. In some cases, none of the groups were able to take the lead so decisions were endlessly discussed. But at other times we were collectively agreed on the vision, and the work developed seamlessly. In the end, the overall process of the project was relatively smooth sailing. We were able to communicate and operate effectively as a unit, and despite (many) setbacks and intense experiences, we completed the project together.

In the following pages, each sub-team explains the decisions and processes that took place in our studio, and compares it to what happened in reality.



WHAT IS SEA-LEVEL RISE?

Climate change has many direct and indirect consequences that are already starting to reshape our physical and political landscape. One of the biggest challenges being the rising sea levels that threaten to put parts of, and complete countries, under water with huge consequences for humanity.

Sea-level rise is occurring at the rate of a couple of millimeters each year, but this is rapidly accelerating due to climate change caused by human activity. Intergovernmental Panel on Climate Change (IPCC) estimated that Antarctic melting would contribute just a few centimeters to sea-level rise by 2100. (report 2013). However new information from an article in this year's March issue of Nature showed the Antarctica melting much faster than predicted and thus predicting sea-level rise to be as high as 6 m in year 2200 and 18 m year 2500.

This prediction is based on calculations that the warmer sea will have a larger volume compared to a cold sea. Also, melting of the ice caps and glaciers will not only add more water in the sea, but also change the currents and the earth's gravity. This causes the whole sea distribution to move. When the icecaps disappear the sea will sink in some places but rise in others. On the other hand it will rain more, even adding ice on Antarctica.

It's a complicated system where the amount of greenhouse gasses in the atmosphere, which affect the sea level, is not only made by direct pollution from combustion of fossil fuels but also by deforestation, farms, methane pockets under icecaps, land use etc. ICCP uses different scenarios of future carbon dioxide emission to predict how the sea level will be affected.

Of course, this is only one of the many predictions for future sea-level rise. This particular prediction is based on a scenario where we do not succeed in reducing emissions. But even if we do succeed in reducing emissions, the sea level will still change as it is dependant on ocean currents and distribution which circulates in time zones of hundreds or even thousands of years.

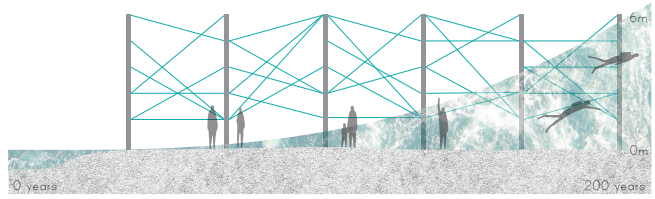
Zooming into The Netherlands

Large areas of The Netherlands is situated below sea level making the country more vulnerable to rising sea levels. About 70 % of the economic output is generated below the sea level. But the threat of the water for the Netherlands does not only come from the sea. The glaciers melting in the Swiss mountains also raise the level of water in the rivers.

The average world citizen adds 4.9 metric tons/capita each year whereas the average Dutch person adds 6.7 Metric tons/capita per year. The difference corresponds to flying back and forth to New York three times in one year.

The leaflet that was presented to the Oerol visitors

THE POLES SHOW THE ESTIMATED SEA LEVEL IN THE YEAR 2200, 6M ABOVE N.A.P.



Visualization of one of the possible scenario for sea-level rise.

The installation aims to create a dramatic visualisation of possible future sea-level rise in a way that cannot be experienced by reading statistics alone.

With our background as Architects, Landscape Architects and Urbanists, we intend to visualise the future sea level in an architectonic installation, so it can be experienced. But experience is only one thing. We also aimed to find out what the general awareness of this phenomena is. Asking you to react to statements in the installation connected to levels of awareness and concern, a new man made sea is simultaneously being created. The new sea level will become more visible the more awareness and concern there is, or become a physical barrier for participants when concern and awareness is low. Placing your own thread low is easy but makes life harder for future visitors. Tackling sea-level rise will require effort and new tools, represented in the attachment of high threads. Some of the statements are extreme to provoke a discussion. We do not put any value into where the different answers are put but simply tried to make the placement indicated how concerned people are about sea-level rise.

Foresea strives to connect the intangible concept of sea-level rise to the individuals of Oerol.

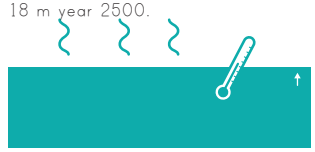
The outcomes of the installations will be presented on our website; iopm.nl.

Sea-level rise is at the rate of a couple of millimeters each year, but it is accelerating due to climate change caused by human activity.

The rising of the sea is a slow process which means that we have not yet seen all the consequences of the greenhouse gases already emitted. It is a complex issue connected to many factors.
Melting of the ice caps and glaciers

not only adds more water in the sea, but also changes the earth's gravity causing the whole sea distribution to move. When the icecaps disappears the sea will sink here but rise further away. Another cause is the larger volume of a warm sea compared to a cold sea. On the other hand it will rain more, even on Antarctica adding to the ice. A recently published article in Nature in March 2016 showed that the ices of Antarctica are melting much faster than

predicted and sea-level rise might be as high as 6 m already in year 2200 and
18 m year 2500.



Since this is a very complex issue there are many different predictions for the future sea level. They also depend on how well we succeed in reducing our emissions. The 6 meter sea-level rise is based on a scenario where we continue to emit greenhouse gases. This installation strives to give you an impression on what 6 meter sea level could mean. But 6 meters is not an inevitable future, it is a scenario of what might happen if we carry on business as usual.

The average world citizen adds 4.9 metric tons/capita whereas the average Dutch person adds 6.7 Metric tons/capita. That corresponds to flying back and forth to NY three times in one year. This means that the average Dutch emits over one third more than the world average. This means that each of us are contributing a lot but also that we have the possibility to reduce it a lot. We have the power to change the image of the future.

FORESEA

INSTITUTE OF PLACE MAKING

Follow the daily activities of the creation of Foresea here www.iopm.nl

The project has been created by 12 architectural students and 2 mentors from the TU Delft.

Design and production:
TU Delft Landscape Architecture

Sponsoring:
DIMI Delft Infrastructures & Mobility Initiative
waddenacademie
Stichting N.H. Bos

DESIGNING FORESEA

This chapter describes the design decisions that took place in the final, hectic weeks before and during the festival. The design and construction aspect of the project was especially intense, given its ambitious scale and the short time frame of just 3 weeks. For most students, this was the first time anyone had delivered a project from conception to construction, so there was a steep learning curve.

The overall shape, spacing and height of the grid, the pole material and type of string, as well as the site location were still to be decided. But the choice of materials was most difficult because it was interdependent on many other factors, such as the cost of each material option and its optimum construction method, therefore the size of project we could afford, and if we wanted a professional contractor or if it was simple enough to build ourselves.

Originally the plan was to use 60 wooden posts of 200mm diameter and 6m height, which turned out to be well beyond our budget. The only contractor willing to do the work quoted 10,000 euros, including expenses such as a hotel for 3 or 4 workers and shipping heavy machinery from the mainland to Terschelling. This was not exactly desirable.

The problem was that for the structure to be stable on the sandy ground, it needed to be approximately one third underground. We needed 9m long poles, driven 3m down. At this point we questioned the scale of the project - could we really do this? Wasn't it too crazy an idea to entertain? Perhaps it would still be impressive at 4m high, which would represent sea-level rise at some other time in the future. It became a question of aspiration, not construction. After all, anything could technically be feasible if you had the time and money. We bought a 6m high drainpipe to see how high we were really talking - it looked absurdly tall. But it also inspired us to dream bigger, and eventually we decided that the 6m height mustn't be compromised.

Then we explored alternative materials. The PVC drainpipe was much lighter, it could be lifted with one hand easily, but it was weak and not ideal as a construction material. Someone suggested using steel poles; stronger than PVC and lighter than wood. We visited a supplier, who suggested that we could split the pole into two sections for transport, and it would all be within budget. We then checked our plans with the civil engineering department, who suggested the poles only needed to be 2m underground, so the project was a-go.

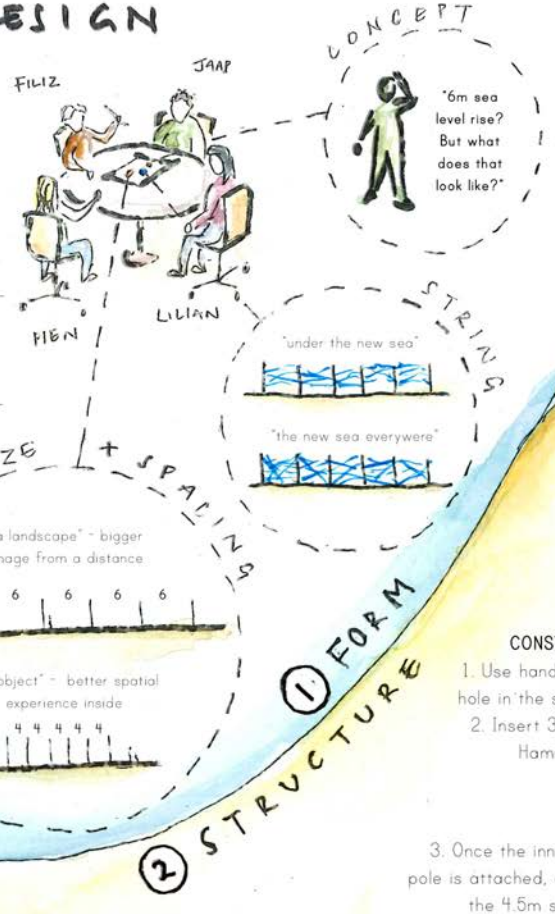
The concept involved making 'a new sea', so the form should be wide and expansive, but with the poles so far apart the lengths of string were staggering. We made numerous models to test the image, and eventually decided on a rectangular form to imply a larger grid. A spacing of 4m created a pleasing proportion, and the triangular grid meant that all the poles would be equally-distant. This prevented the 'boxiness' of a square grid, and the strings wouldn't cross over each other.

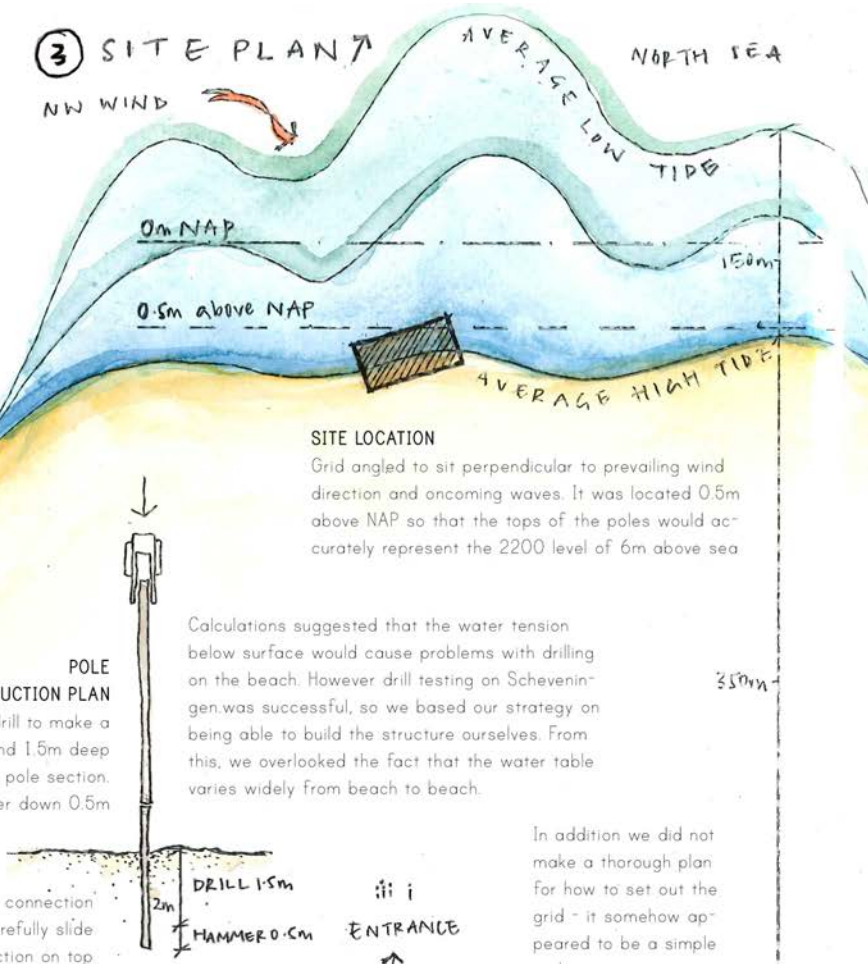
The graphic essay overleaf illustrates an overview of the above; the design processes and rationalisations we made prior to the project. It then compares this to how those decisions worked out in reality, with some amusing results!

STUDIO DESIGN

The design and construction team developed the concept idea and tested multiple designs. Our key aim was to use poles and string to create a tangible, physical representation of the 6m sea-level rise.

For the form however, we modelled options for different grid shapes, size and spacing. We agreed made it rectangular to maintain a strong spatial experience while suggesting a longer width. The triangular grid allowed for poles to be equidistant, and no strings crossing. Spacing of 4m created a pleasing proportion.





SITE LOCATION

Grid angled to sit perpendicular to prevailing wind direction and oncoming waves. It was located 0.5m above NAP so that the tops of the poles would accurately represent the 2200 level of 6m above sea

Calculations suggested that the water tension below surface would cause problems with drilling on the beach. However drill testing on Scheveningen.was successful, so we based our strategy on being able to build the structure ourselves. From this, we overlooked the fact that the water table varies widely from beach to beach.

POLE CONSTRUCTION PLAN

1. Use hand drill to make a hole in the sand 1.5m deep
2. Insert 3m pole section. Hammer down 0.5m
3. Once the inner connection pole is attached, carefully slide the 4.5m section on top

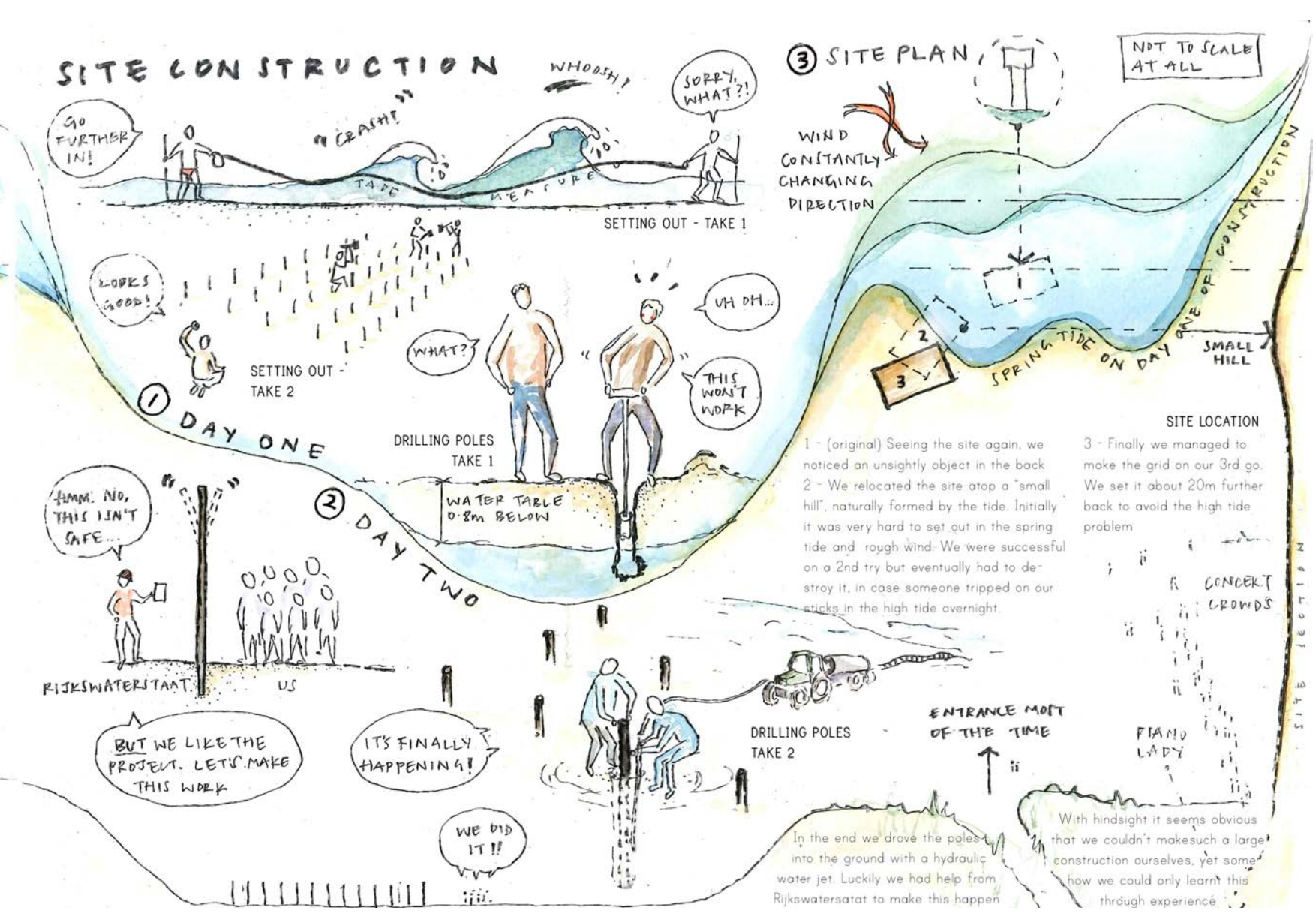
In addition we did not make a thorough plan for how to set out the grid - it somehow appeared to be a simple task on paper.

MATERIALS

WOOD
- durable and heavy
- must be constructed by professionals
- expensive (must scale down project size)

PVC DRAINPIPE
- lightweight and can be handled by ourselves
- too weak as a construcion material

STEEL POLES
(the chosen option)
- durable and not as heavy as wood
- thought to be possible to construct ourselves


SITE CONSTRUCTION
GO FURTHER IN!
"CRASH!"
WHOOSH!
SORRY, WHAT?!
TAKE
MEASURE
SETTING OUT - TAKE 1
LOOKS GOOD!
SETTING OUT - TAKE 2
1 DAY ONE
WHAT?
"
"
UH OH...
THIS WON'T WORK
DRILLING POLES TAKE 1
WATER TABLE 0·8m BELOW
2 DAY TWO
hmm. NO, THIS ISN'T SAFE...
RIJKSWATERSTAAT
US
BUT WE LIKE THE PROJECT. LETS MAKE THIS WORK
IT'S FINALLY HAPPENING!
WE DID IT!!
DRILLING POLES TAKE 2
3 SITE PLAN
NOT TO SCALE AT ALL
WIND CONSTANTLY CHANGING DIRECTION
1
2
3
SPRING TIDE ON DAY ONE OF CONSTRUCTION
SMALL HILL
SITE LOCATION
1 - (original) Seeing the site again, we noticed an unsightly object in the back
2 - We relocated the site atop a "small hill", naturally formed by the tide. Initially it was very hard to set out in the spring tide and rough wind. We were successful on a 2nd try but eventually had to destroy it, in case someone tripped on our sticks in the high tide overnight.
3 - Finally we managed to make the grid on our 3rd go. We set it about 20m further back to avoid the high tide problem
R CONCERT CROWDS
ENTRANCE MOST OF THE TIME
PIANO LADY
In the end we drove the poles into the ground with a hydraulic water jet. Luckily we had help from Rijkswatersatat to make this happen
With hindsight it seems obvious that we couldn't makesuch a large construction ourselves, yet somehow we could only learn this through experience.
N 41°03' 34.1"

CONSTRUCTING FORESEA

1. DESIGN

After determining the material and length of the poles, we decided to cut up the 8m long poles into two parts of 3m and 4.5m (the 0.5m parts were partly used for other components in the project). This made the construction process and transport on the island manageable. The cut meant that a third connection pole was necessary. Originally this was designed to be connected by a bolt in the upper pole and a piece of duct tape to create more friction in the bottom pole.

2. TESTING AND PREPARING THE DRILLING

To connect the bolts to the poles 120 double holes needed to be drilled. Meanwhile the hook system was designed as a tie wrap construction either with S-hooks or curtain hooks where the first was sturdier but the latter seamed more elegant when wrapped to the poles. Also the curtain hooks seemed suitable to let wires go in different directions which convinced us to choose them over the S-hooks. After the first test drilling we also thought of just putting in the curtain hooks in holes where we would not need the ugly tie wraps anymore. We then figured out that the hooks where not able to support multiple directions of string when there is already string attached. We fixed this by putting in a hook for both directions per hole.

This meant that instead of the initial 120 now 900 extra holes needed to be drilled, so we made a system using a mold with a predefined drilling pattern. Now it would be possible to use a hand drill instead of a pillar drill to speed up the process. Different test molds where made from scrap material dug out of an construction site dumpster. Because of the possibility of wearing out after drilling hundreds of holes, the final version turned out to be just a measurement tool for marking the places of the holes instead of using them for drilling. A centerponce, which marks and steers in the drill at the right spot, would be used in order to keep the hand drilling possible.

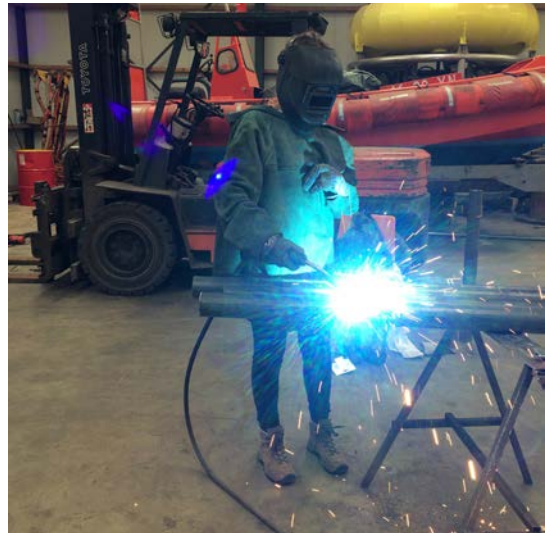
3. ON THE ISLAND

The poles arrived only 1 ½ day before the festival started so time was our enemy in the pole drilling process which would take place at the workshop of Islander Jetze de Beer. Confusion led the poles, after delivering the 3m parts at the projects location; to the front garden of Jetze where we originally thought the working would take place. This was not the case and since the transport company knew Jetze as well they figured the right workshop direction out themselves and before we were there the poles had already arrived on the right location, next to where the poles had left an hour before, on the industrial area next to the harbor village in West Terschelling.

The next half an hour Jetze explained all machinery in his workshop within two minute tutorials each. He advised us after hearing our plan to just weld the pole and connection pole together instead of bolting it which would never work. The holes would never line perfectly out with the connecting inner poles. Also he suggested just using the pillar drill instead of hand drilling and after showing al the instruments, including a metal filer to let all the poles fit well, he left us alone in order to practice his other profession; beer brewing.

4. WORKSHOP FACTORY

Since time was still our enemy we started straight away with measuring, welding and drilling the poles and soon found out that Jetze was right advising not to use hand drills. They were horrible to use and took forever, breaking every drill after just 5 holes. Getting a bit panicky over the time spent on one pole we tried the pillar drill again which seemed to get the work done in time especially after reaching a top speed of 6:30 minutes per pole. By the end of that evening we figured the most efficient production line working pattern out and left the workshop with a slightly more optimistic feeling then when we entered.



The next morning we got news from the beach team asking if we could cut up 30 of the 3m poles into 60 poles of 1.5m because the ground drilling was not going as expected. So after another 2 minute tutorial of Jetze on steel sawing we picked up the 30 poles at the dunes 300m from the project location, where they were carried by hand. And after bringing them to the workshop we waited for the confirmation only to hear that we could bring them back to the beach. Rijkswaterstaat did not give permission to the new construction of only going in 1m underground where they wanted for every 3 parts above ground 1 part underground

which meant the poles had to be at least 2m underground. They then made the very generous offer to arrange a water lancet to get the poles in at the desired depth of 2.5m.

The transport company have been very helpful by coming always on time and even early as was the case in the end of the day. We just managed to drill and weld all 60 poles in time before they were send off to the sand. We then also heard from the beach team that the pumping was going great and the grid of 3m poles was put in by the time we were done.

5. BEACH FACTORY

We had one night and morning to put all the hooks in the poles and get the poles up so we had to think of another production line where there were mainly 3 teams. One that put all the hooks in and bring all the poles to the right place (9 persons), one to lift the 4.5m poles into the 3m poles (3p) and one who overviewed the grid, lifting and at the same time filed all the 3m poles(2p). Getting the poles up and in was easier than expected not in the least because it was decided to get the 3m poles half a meter lower into the ground than initially decided. This was done because of the different location the grid was placed eventually which was higher in relation to the sea water level resulting in lowering the poles to stay accurate to the surrounding landscape. But sometimes the pole did not go in well where we had to lift them out which was a lot harder than getting them in. Also the hooks were slightly bigger than our test hooks so getting them into the drilled holes turned out to be a lot harder than was expected. We managed to hook all the poles and put half of them in before it was too dark and managed to do the rest in the morning, a couple of hours before the festival started.

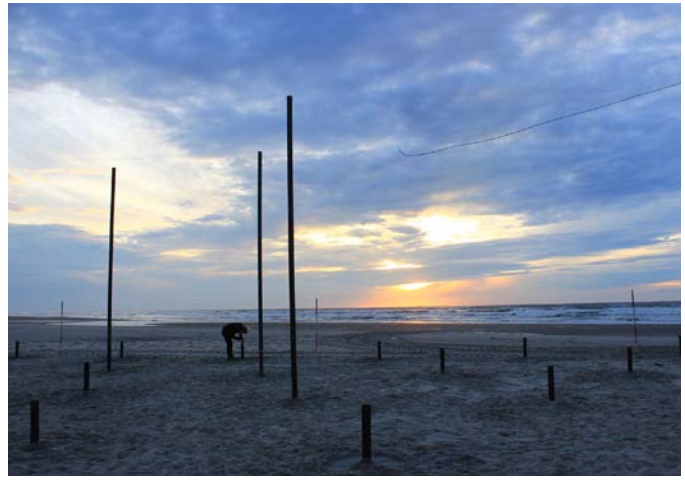
6. FESTIVAL

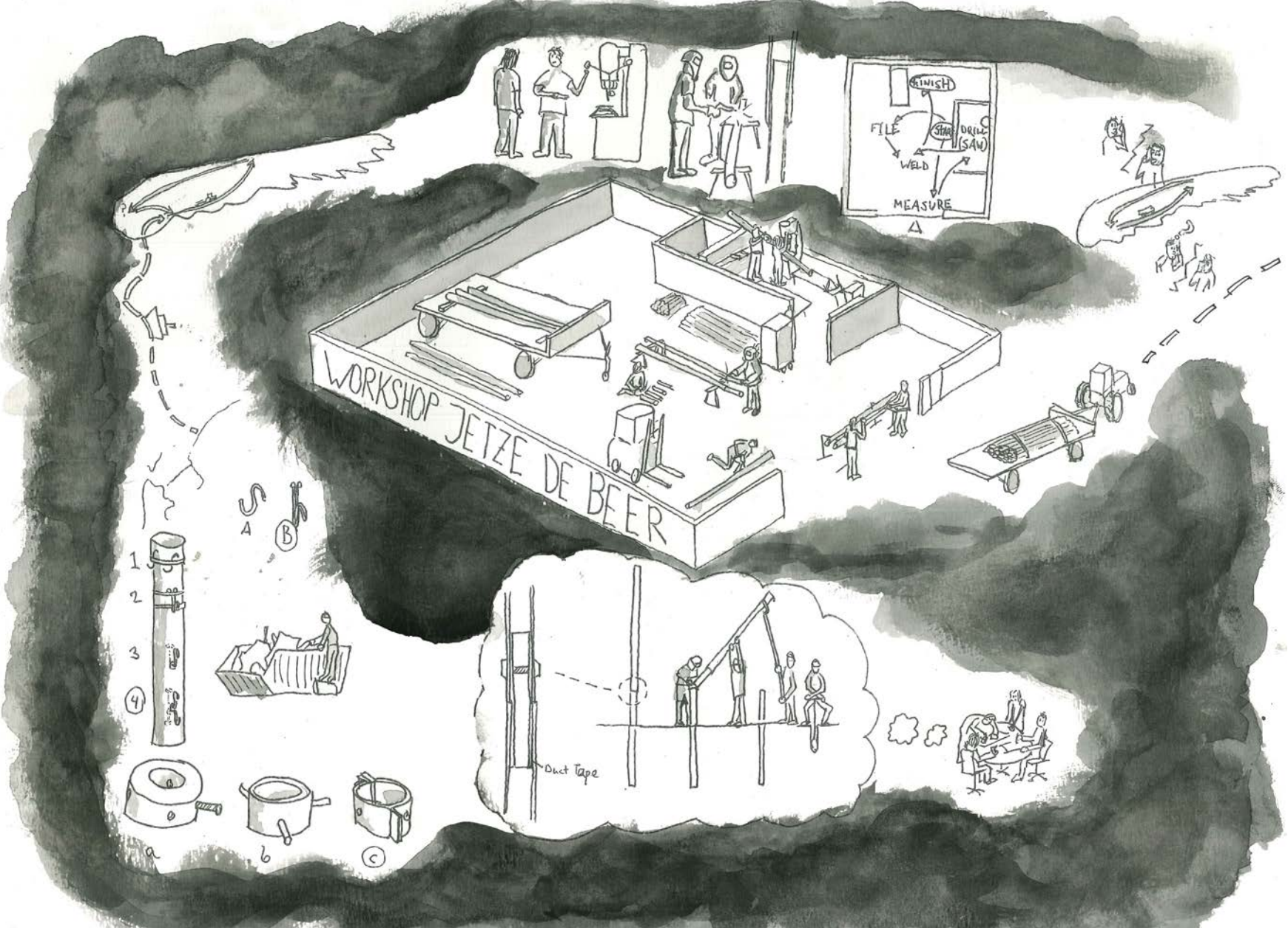
Due to the lack of time to practice and test the installation we changed some of the ideas during the festival. Firstly, it was impossible to let all visitors hang up one rope which took longer than expected, so now people answered the poles per group. Also we skipped one of the yarncolors because with now groups answering we had more than enough yarn where one was thinner than the others and therefore a lot harder to handle in the wind. Later on we also added new hooks because some became too crowded with ropes and became unusable.

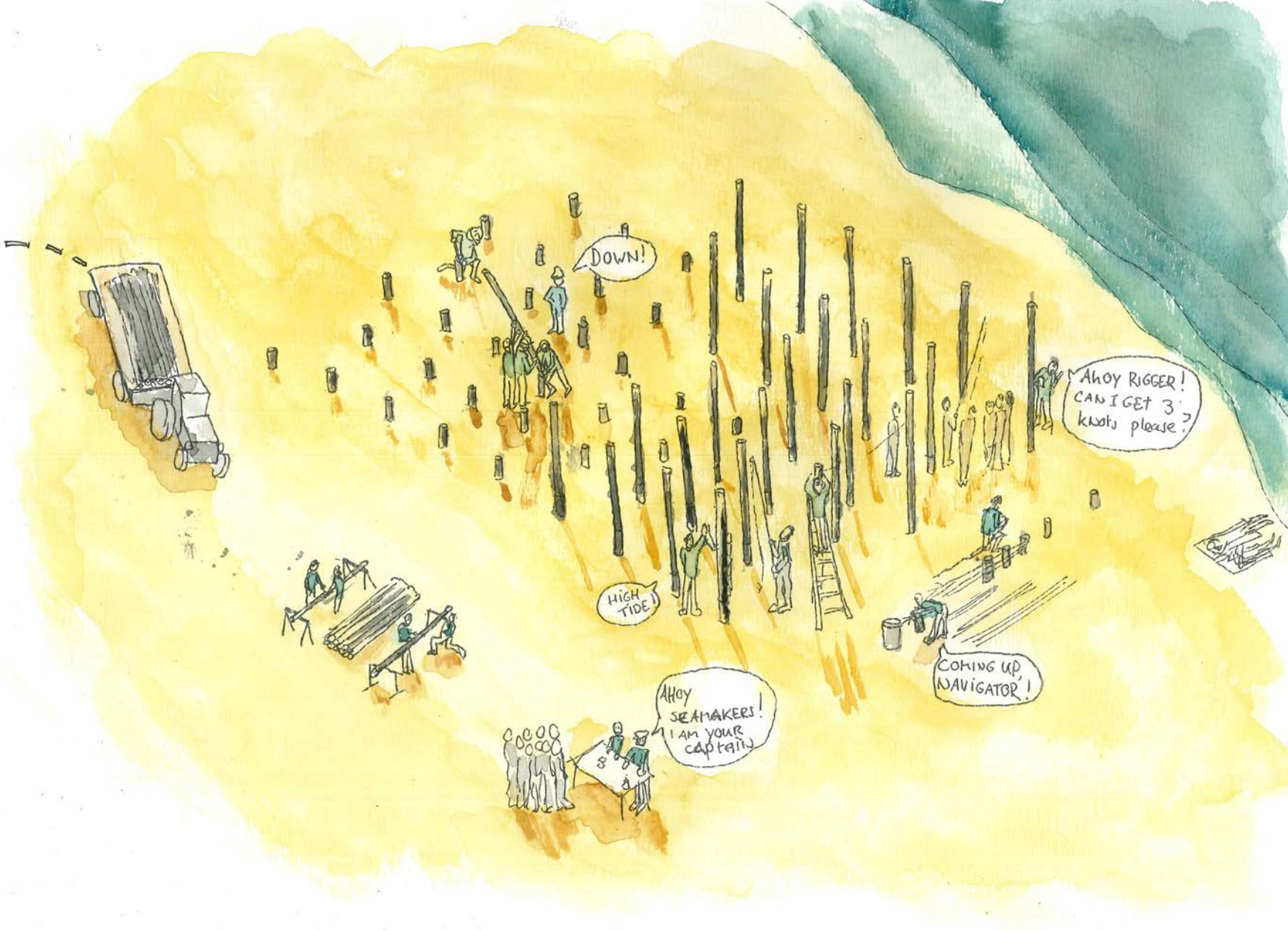
The line cutter and runner job (rigger and swabby) was optimalised during the festival. The predesigned yarn holding device did not work as expected and a bucket was used instead on the first day. Later we found out that it saves stress and time at busy moments to prepare a lot of strings so we used the small poles to make multiple cuts at once.

Overall the process was hectic but successful and the general feeling now after the project is a positive one. Although there were a lot of things that could have gone wrong resulting in no project every piece landed on the right spot in the end. There were moments of frustration, panic and despair, especially at the beach, but pressure can manifestate itself into a workflow powerful enough to get the job done. We also realized there was too much to do in the 2.5 weeks between decision day and start of the festival for having a lot of discussion

What we can learn from this process is first and foremost that more time was necessary; time to visit the island in order to do proper tests on location and determine the exact spot; time to order the poles and get test pole prior than 2 days before start; time to practice your role and test the participation part in order to let the process go more smoothly the first days. Next to that the value of testing proved itself in some parts (drilling the poles) but in others the conditions where not optimal (ground drilling) where a cancelation of the project came closest because of this incorrect test.




WORKSHOP JETZE DE BEER
FINISH
FILE
START
DRILL (SAW)
WELD
MEASURE
Duct Tape


DOWN!
HIGH TIDE!
AHOY RIGGER! CAN I GET 3 KNOTS PLEASE?
COMING UP, NAVIGATOR!
AHOY SEAMAKERS! I AM YOUR CAPTAIN

INTERACTION

Exploring the unknown: connecting the individual to the intangible

Foresea was the physical representation of the reality of future sea-level rise if CO2 emissions continue to be emitted at the current rate. Although physically bringing awareness of this abstract notion to the visitors, it was also the objective to connect the issue to the individual and simultaneously understand the existing level of awareness on the topic. I will further elaborate on our method of approach to achieve this ambition.

Our initial idea asked visitors to mark, on the steel masts, where they thought sea-level rise was in two hundred years. The intention of this was to research existing awareness of the rate os sea-level rise. Testing this on people around the university found a surprising variety of answers as well as a general unawareness on the real figures.

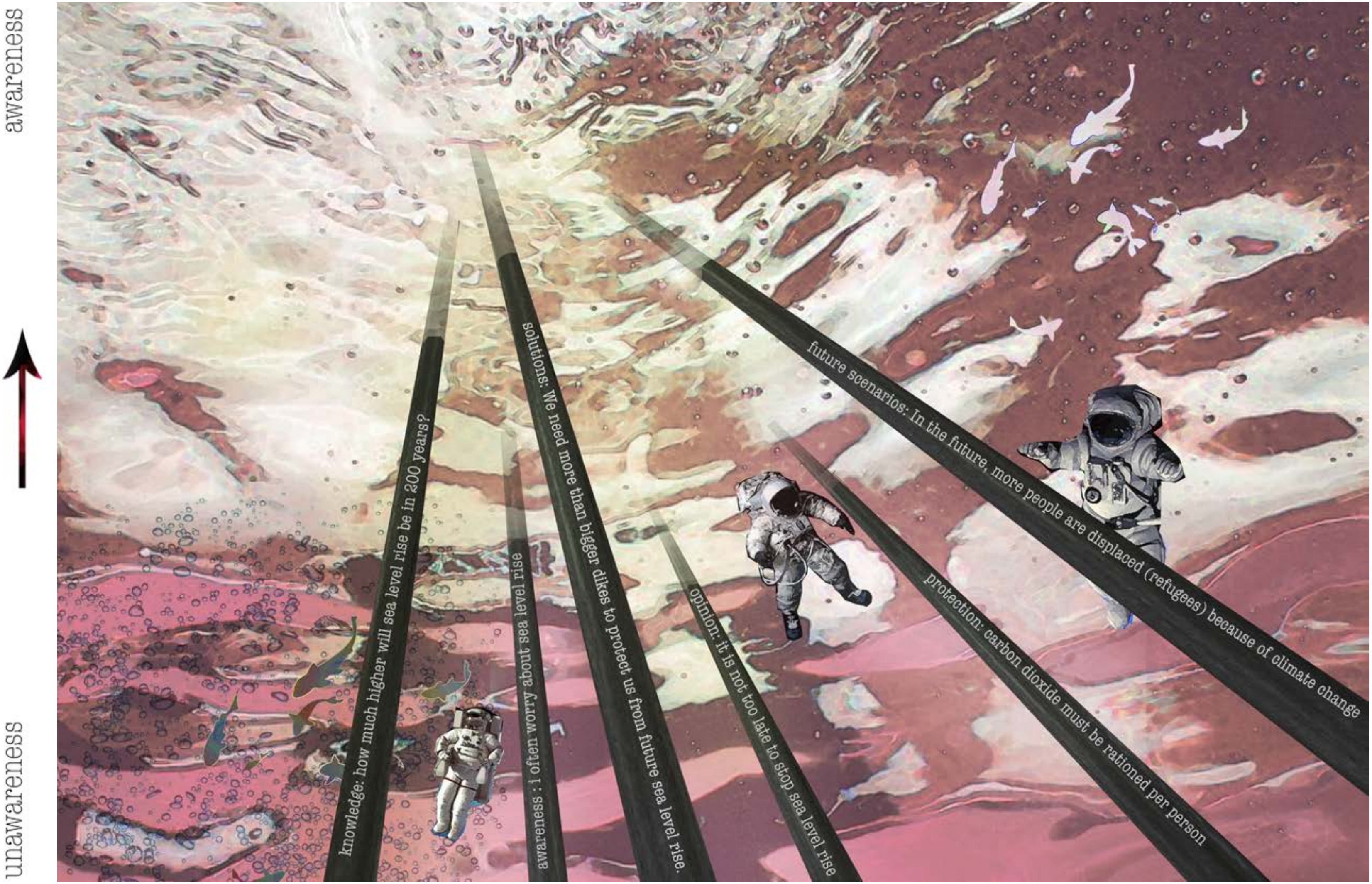
Through discussions with the team, it was also important to connect the intangible idea of sea rise to individuals on a personal level. Thus we tried to elaborate on the topic more to be able to discuss with visitors and collect their opinion. The team came together to brainstorm on the topic, generating a variety of ideas and questions surrounding the subject. Who was responsible for the cause, should the topic be given more attention by media, do we feel guilty?

The following stage was implementing these questions in the design form. Many questions had potential for a multitude of answers, and though tests of creating 'question poles' and 'answer poles' this interaction form seemed unable to work as peoples answers were unable to predict for answer poles. Thus a system without answer poles had to be created.

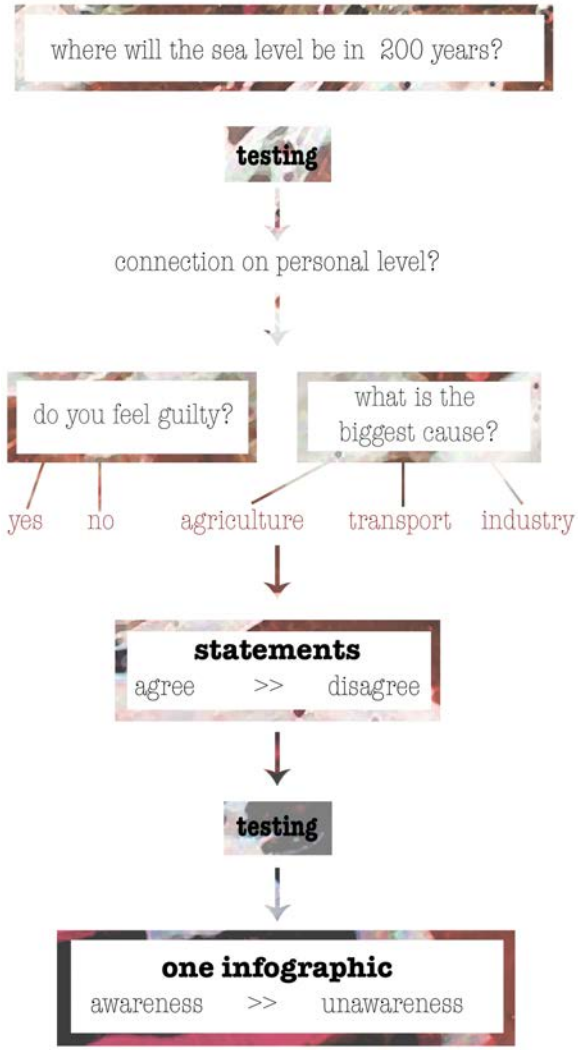
From this conclusion, a system of only question poles was decided. The answers to the questions would be placed on the pole itself. From this it was decided to have the same scale of answers on each pole; which would not only make the system easier to read by individuals but also join the entire design in one interactive infographic.

Thus, the questions were changed into statements in which a scale of agree to disagree would be formed. Each pole contained a different statement relating to the subject but with the same scale so that the design could be read as one. The statements were again tested on people in the university to check understanding of our statements and re formulate them in accordance.

It was vital not to place right or wrong on this scale, neither the agree or disagree answer was to be the 'correct'. The project was not to create moral guilt on the subject but research visitors awareness. Through multiple discussions and testing of ideas, the agree was placed on top of the masts; showing awareness to the subject and thus disagree at the bottom to show unawareness. People going out of their way to place the string high and show the sea, or take the easy option, placing the string low and creating barriers for others.

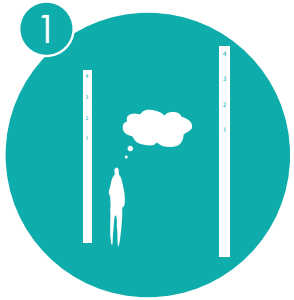

awareness
unawareness
knowledge: how much higher will sea level rise be in 200 years?
awareness : i often worry about sea level rise
solutions: We need more than bigger dikes to protect us from future sea level rise.
opinion: It is not too late to stop sea level rise
protection: carbon dioxide must be rationed per person
future scenarios: In the future, more people are displaced (refugees) because of climate change

The main intention was to provoke discussion between ourselves and visitors and amongst the visitors themselves. Extreme statements on a wide variety of topics were used to provoke this. Although the statements were tested on individuals in our own university, the achievement of the statements could not be evaluated until the festival itself. In evaluation, some statements did not work well with the infographic as a whole. However the majority succeeded in our intention to generate conversation on the topic and find peoples opinion. The result; a creation of human scaled introspective spaces in the unwelcome vastness of the beach where the individual could relate to the intangible subject of sea-level rise.

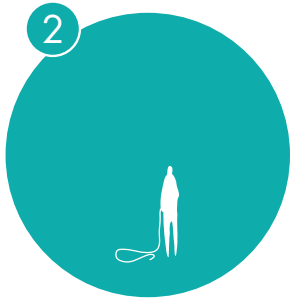


INSTITUTE OF PLACE MAKING

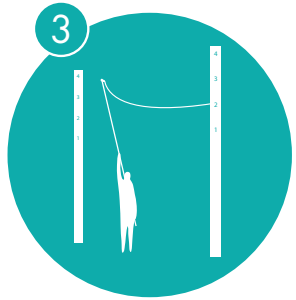
Your poles are ○ and ○



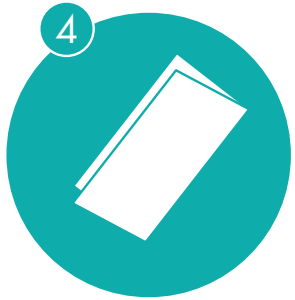
Find your poles and consider the statements on your poles.
Go to the navigator.



Get your personal waterline that fits your answer.



Put up the waterline on the hooks corresponding to your answer.



Now, you may open the leaflet!

REFLECTION

A journey into the future and into the sea. 11 weeks, 12 students and one project. This is a story about creativity, setbacks and success. About how, with art, you can create awareness and discussion. It is a story about meeting 6000 visitors and creating art together. It is about the present and the future meeting at a very special place - just on the verge of the raging sea at the vast beach of Terschelling.

The project was an extraordinary and unique experience for the twelve students involved. More than the successful realisation of the project, it was a journey of the development of our own capabilities.

The team worked incredibly well together and everyone had valuable input. When we started out we did not know each other, but soon enough we were running like an office, with specialised groups focussing on different tasks. Reflecting on our teamwork, there were points when we could have improved on our coordination. Sometimes the sub-groups were unaware of each other's decision-making, which resulted in unnecessary miscommunication. But everyone was enthusiastic and understanding, so we were always able to compromise and never had major arguments.

The design phase of the project took an extensive amount of work, yet getting the poles standing required some luck. The ambitious scale of the project, although tangible on paper, was in reality a huge problem in many aspects. Through the amount of time the team had in creation, there is little doubt that we worked as hard as we could; but in hindsight the construction needed more testing. On site we were not able to get the poles to the depth required for safety by the method planned, which was at the time crushing to our motivation. But through the team's determination we succeeded in our ambition and we were able to get a great 57 out of 60 poles into the sand.

As design students we normally deal with form but rarely get to the stage of user participation. The roles we played in participation with visitors during the installation was not a main focus beforehand yet became a defining aspect. We all gained valuable reward from our interactions with visitors, we think we have an idea of people's habits which we design accordingly but actually talking with people was an eye opening experience. Such a broad range of people gave opinions more diverse than our own general scope.

The combination of the introspective place we made as well as the provoking statements we asked led to extraordinary discussions between visitors and ourselves. Also between visitors that did not before know each other. To all of us it was an unexpected surprise to have so many people bring their heart felt opinions into our project and want to be a part of it. Through these discussions, we as a team, gained as much through the installation as the visitors. Additionally to this positive experience, it was positive to note the high level of both awareness and concern the visitors showed on the subject.

Overall, the project was a success. Not only in terms of numbers of visitors to the project, which reached over 6000, but the general reaction from visitors which was incredible. The project turned out a beautiful and powerful piece of work, but also created a unique experience for the visitor.

MEET THE TEAM

JADE APPLETON – The creation of the Oerol installation is a chance to challenge my usual design rationale by focussing on imaginative and artistic concepts..

JOLIEN BOAS – Oerol is about telling a story about a special place,Terschelling. Also it is about giving people an experience that is unforgettable.

LEYANG CHEN – Oerol is a moment of hurrah! – for every step that we come closer to understanding nature..

FILIZ COSKUN - Oerol gives an opportunity to learn more about the unique landscape of Terschelling. It's an exciting interdisciplinary architectural assignment regarding team work and the actual building of a design in 1:1.

JEAN-PIERRE DROGE – Oerol is about driving a van back and forth.

NORA HARTMAN – Oerol gives people the possibility to explore and discover. Discover the island, the landscape, others and yourself.

SICCO JANSEN - Oerol is for me the dialog between art, nature and culture. Of the visible and the invisible and of the intangible that briefly becomes tangible.

JAAP LE – Oerol is a broad landscape of art and nature.

LILIAN TRAN – Oerol provides an opportunity to step back from the pervasive bureaucracy of urban life, and instead immerse oneself in how we as human beings identify with the land that we inhabit.

PIEN KUIJPERS – Oerol is not only about the experience of the festival but also the experience to actual build a design on site. A temporary installation where culture, art and nature meet.

ANNEMETTE SCHELTEMA – Oerol is the strength of imagination! Building a temporary something from nothing with only the good memories afterwards.

ERIKA WOLTERS – Oerol is about experiencing the landscape in new ways. It's about art and culture meeting the vastness, the beauty and the powerful forces of nature.

"I loved the discussions with everyone and that visitors would be in the installation for a really long time, having huge discussions. It was a big reward to hear people think so much, and ask, 'what can we do, how can we prevent this?'. These comments were really valuable"

Erika Wolters

"I was the director for filming. I liked most seeing how the project integrated with the surrounding, in the waves and wind. Waves giving background music and wind creating a good dynamic"

Louis Chun

"I liked the making of the project, because usually you make a design but you don't see it realised. The render matched the project, the image was what we hoped for"

Sicco Jansen

"I got loads of energy out of the festival and the build up of our own project. The general atmosphere was good, cool projects, people and parties"

Jaap Le

"I enjoyed the project so much, being in our design and being so proud as a group that we did it!"

Jolien Boas

"The process was good, we worked like an office and could divide tasks. It was not about the individual but the collective"

Filiz Coskun

"On the first day when I was the boatswain, the concert ended and these little black ants were dripping off the dunes and coming towards us. Quite terrifying but really funny"
Nora Hartman

"I thought it was brilliant. Unexpected, There was so much to do and see. The landscape itself was beautiful to be in. I never had a moment to sit down, but I didn't want to anyway."
Jade Appleton

"I enjoyed playing the captain the most - to explain the project to people who didn't understand it yet. It was nice to see the surprise on their faces."
Jean Pierre Droge

"I walked back from the installation with two girls, and had a great conversation about vegetarianism. Concluding that being a vegetarian isn't always good for the environment; mangos from south america are still bad for the environment. People really had the time for me, everyone wanted to speak with me for ten minutes at least, which was great"
Mette Scheltema

"The deciding moment of the project was great, everyone had so much energy. But then there was a moment of how could we continue?"
Pien Kuijpers

'Fun meeting everyone, a great project and exhausting'
Lilian Tran

APPENDIX

The following pages contain essays from individual students which explain research for the project in more detail:

- The Site Unravelled by Annemette Scheltema
- Sea-level rise by Erika Wolters
- Sense of Location, and how site specific is our installation? by Jean-Pierre Droge
- Research Foresea by Nora Hartman

The appendix includes all data outcomes of the separate poles.

THE SITE UNRAVELED

BY METTE SCHELTEMA


difference
Resulting in a long strip named
Cumulus Cloud
Stand Cloud
Causes an instability
of Land & Sea
temperature
Cloud
Top of the food chain
Dune Tansy - Tanacetum vulgare
Sea - kale - Crambe maritima
European Sea wicket - Salsola kali
Pre - dune
Scour holes
White - Primary Dune
Grey or Secondary Dune
are older and more stable
SUPERLITTORIAL

THE SITE UNRAVELED

BY ANNEMETTE SCHELTEMA

At first the vastness of the place strikes. A closer look on the changes in conditions along the beach gives an understanding of the (in)direct relations between the biotics and abiotic. The cross-section is roughly devided in 3 sections; the sublittoral, the Eulittorial and the superlittorial. The main difference in the sections is caused by the water table. In the sublittorial is situated beneath the low tide. The Main biobuiler in this ecosystem is the Sand Mason Worms Lanice conchilega; There can be uptil a thousand worms per square meter. With their existence their stabilize the sand bottom and create conditions for plants to grow which attracts fish and other fauna. Underwater oases are created around this little worm.

The Eulittorial is characterized by the intertidal zone. The big changes in circumstances throughout the year, month and even day make it a harsh environment with an specific ecosystem. Seabirds and sandpipers use the eulittorial zone for foraging. The flood mark is a marking point for a new cycle. In the flood mark a lot of biomass is washed up on the beach, the degration of this biomass works as a base for insects and pioneer marine grasses Ammonila Arenaria. The widely spread root system of these grasses catches sediment. The plant is adapted to be buried and grows through the sand to the surface allowing the sediment to pile op. Marine grasses work as a a-biobuilder, creating new pre-dunes.

The Supralittorial zone is outside te tidal range. Nevertheless the ecosystem is mainly based on halophytes. The loose sediment grain is a lot smaller than at the shore line and create a good environment for an active degretion of feces unto nitrogen compounds. These nitrogen compounds are crucial for the rich flora in the dunes. Providing nesting places for dozens of species.



SEA-LEVEL RISE

BY ERIKA WOLTERS

Introduction

Climate change has many direct and indirect consequences that is already starting to reshape our physical and political landscape. One of the biggest challenges being the rising sea levels that threaten to put parts of, and complete countries, under water with huge consequences for humanity. In this essay the causes of the sea-level rising, future sea-levels and what this will mean locally in the Netherlands will be briefly addressed.

Historic data

Looking back into the earth's history the sea level has varied slowly caused by the movement of the continental plates and distribution of land-sea. Since late 19th century the rate of sea-level rise has accelerated and is likely to continue to increase due to global warming. Between 1901 and 2010 the global sea level has risen by 0.19m according to IPCC.

Causes of the sea-level rise

According to Intergovernmental panel on climate change (IPCC) the rising ocean levels has three causes; warmer oceans resulting in thermal expansion, melting of glaciers and ice sheets and reduced capacity for storing liquid water on land. The future rising levels is dependent on the levels of emissions of greenhouse gases.

In their Summary for Policymakers IPCC concludes that humans most likely is causing this development. "It is very likely that there is a substantial anthropogenic contribution to the global mean sea level since the 1970s." Their reports are based on a scientific collaboration between 39 countries and 259 authors.

To exactly predict the rise of the sea level is hard. It's a complicated system where the amount of greenhouse gasses in the atmosphere is not only affected by the direct pollution from combustion of fossil fuels but also by deforestation, farms, methane pockets under icecaps, land use etc.
The sea-level rise will not be evenly spread across the oceans. Some land areas are still rising since the disappearance of earlier glaciers. Heavy icecaps have weighted down the tectonic plates on one side causing the other one to be lifted higher. As the ice melts away the plates slowly shift back into balance causing one side to rise and the other to sink. Other areas might get an amplified effect of the sea rise due to that the extraction of gas, oil or water in the area causing the land to sink. Also the change in ocean currents will result in local variations. The surface of the sea is not flat, it is shaped by the difference in gravity in different areas. Declining gravity of the melting ice caps also affects the distribution of the ocean volume. This gives a drop in sea level close to the melted ice cap and higher levels further away. The melting of the large ice sheets is suggested to alter the earth's gravity distribution so much that it will alter the rotation of the earth contributing to the rising sea levels in some parts. Locally variations in natural resilience of different areas will affect the consequences of rising sea levels with swamps and wetlands as buffer zones.

Depending on if and how much future emissions are reduced the sea level is predicted to rise on an average between 0,3 to 4,8 meters to 2100 according to IPCC. But resent studies suggest that the sea level is rising much faster than in ICCP's prediction from 2013. According to The Royal Netherlands Meteorological Institute (KNMI) new studies suggest that the ice of the Antarctic collapse and break into smaller parts much faster resulted in even more accelerated sea-level rise. If the emissions are not reduced already in 2200 the sea-level will have risen with 6m and 2500 more than 18m. In Advancing the Science of Climate Change assessed by National Research Council's America's Climate Change project the ICCP prognoses is described as conservative and not taking into account the important behavior of the changing quality of the ice caps at rising

temperature suggesting that the rise may be up to two meters this century.

The inertia of the global environment means that for every 1 degree Celsius of temperature rise we commit to a sea-level rise of 2.3 m in the coming 2,000 years.

Many different scientific reports exist on the subject suggesting very different values for the sea-level rise in this century. The different values is more showing a difference of prediction of what speed the change is happening than if it will happen. It is also known that climate change causes more extreme weather with heavy storms and rainfall which can contribute to more flooding worldwide.

Consequences globally

The consequences of the rising sea levels are hard to fully predict. It will largely affect the islands and coastal areas with increased coastal erosion, flooding, higher risk of storm induced flooding, salt water leaking into ground water, loss of areas for food production, recreation, tourism and dwellings and loss of cultural and historical valuable sites.

Only looking at Bangladesh in the case of a small raise of 400 mm would result in 7-10 million climate refugees from that area. Several nations might be completely gone by 2100. Globally huge amounts of people will have to leave their home due to climate change causing political tension. Large areas of farmland will also disappear into the oceans creating food shortage and economic loss.

Sea level rising in the Netherlands

Large areas of the Netherlands is situated below sea level making the country more vulnerable to rising sea levels. About 70 % of the economic output is generated below the sea level. But the threat of the water for the Netherlands does not only come from the sea. The glaciers melting in the Swiss mountains also raise the level of water in the rivers. A failure in the water systems will have catastrophic consequences.

Strategies for dealing with the risk of flooding have shifted from raising dikes to rebuilding marshlands and "sand engines" to renew the beaches. There are also large scale residential projects where the houses are designed to float with the water level. But also the dikes need to be heightened and improved to withstand the raising sea. Improvement of dikes, creation of natural buffer zones and other means to preventing the Netherlands from flooding are not cheap. A government commission recommended that the country should spend 1 billion euros more on flood control per year. The land subsidence also increases the effect of the rising sea. The Netherlands' islands are vulnerable to the climate changes. Increasing coastal erosion will raise the importance of maintaining and improving the protection of these islands.

Conclusion

The question is not if the sea is rising, but how fast and how much it will rise. The speed and the extent to which it happens is largely dependent on the humanity's ability to act to drastically reduce the greenhouse gas emissions. Protecting our cities from flooding will not be cheap. This means that poor countries will be more affected by the sea level rising than richer countries but it will inevitably have huge consequences globally and locally and will reshape our political and geographical landscape.

SENSE OF LOCATION, AND HOW SITE SPECIFIC IS OUR INSTALLATION?

BY JEAN-PIERRE DROGE

A sense of place, the overall theme of the Oerol festival, is about the invisible, the untouchable.

About the emotions you feel at certain moment. With this essay I want to question myself why our installation looks the way it does and what does it interact with it's surroundings. Is the project suitable for different locations, and how will it adapt to these new places. I got inspired by a question from a visitor who suggested the idea that our installation had to move around the country, so we could analyze different types of audiences. The precise quote was; "Why don't you move your project to the Efteling or the Mc Donalds". Then the question came to me, how will our project look like over there, what do we want to change?

Before we switch locations, I want to explain a little bit more about the importance of our location. The coast landscape of the Netherlands, and especially the Waddensea, is a very dynamic one. The natural changes in the landscape are most of the time very slow, but the influence of men is speeding things up. We want to show these changes to the visitors of Oerol. But the sense of place on the beach of Terschelling can be experienced in many different ways. The choice which elements will be expressed lies in the hands of the designer (in our case the group). The design tries to visualize the invisible, show underlying processes and create value and awareness on the landscape. As for me, this is the sense of place.

Ten days long our installation stood proud above the surface of the North Sea, an impressive image. But the landscape it's in, is about to change in the coming years. The Waddensea is threatened by sea-level rise and we wanted to make people aware of this change. Instead of only hearing about sea-level rise in the news, it's a challenge to imagine how it will change the landscape in the future. And what can be a better place then to show this threat next to the sea itself. The contrast of a discussion about sea-level rise after a pleasant piano concert in the dunes and a long refreshing walk makes our project even stronger.

As an experiment I imagined our project in different locations, because not only visitors of Oerol have to be aware of sea-level rise. I tried to adapt our design to fit the location, but still stuck to the original concept of poles and threads. Hopefully these images will inspire people to think about sea level rise in different occasions. During a routine drive in your car filled with petrol, on intercontinental holidays, or in a guilty moment at your favorite fast food restaurant.

As a conclusion I could say our installation can be constructed at many different locations to create awareness on sea-level rise all over the world. The difference in some cases with our site is the absence of the sea, you have imagine it yourself, as if your in another place. So the sense of place is less strong then at the beach, the physical relation with sea turns out to be very important.Although you could create a sensorial experience of water on these different sites, it will never compare to the real strength and power of the sea.

RESEARCH FORESEA

BY NORA HARTMAN

Foresea is initially made to give Oerol visitors an odd experience according to the rising sea level and to provoke a discussion about this topic. An experiment that we did in the faculty of Architecture about how high the sea level would be in 50, 100 or 200 years, evoked questions from the interviewed students as: 'Where does all the water comes from?', 'Is the sea already rising?' and 'Can we still stop the rise?'. These questions and remarks from the visitors made us realize that there is a lot of ignorance when it comes to sea-level rise.

When the project developed, the interactive part of Foresea gave us opportunities to collect data according to the visitors' awareness about sea-level rise. By hanging up the waterlines at a certain height, visitors gave their opinion on the statements connecting to the poles. The sea of opinions kept on growing during the festival. People could immediately see the opinions from the previous visitors and could add their own. To have a good overview of the data in the end, we decided to write down the visitors' opinions according to the statements together with some personal information. We collected data out of more than 2300 visitors. The data is processed into graphs. We selected a view statements which are presented in this chapter. The other statements can be found in the appendix.

Research method

The research that is done in Foresea is exploratory research: we didn't know exactly what kind of results we were going to find and we didn't know exactly how the research was going to develop. Our main aim was not to collect data, but to give an odd experience of the rising sea level and to provoke a discussion. Nevertheless, we collected data out of more than 2300 visitors, so it was worth collecting and processing the data. The research also tends a little to be descriptive research, since our deep-seated question was to find out how aware and concerned the Oerol visitor is according to the rising sea-level. Although, the project is not fully constructed around this research question and because of the playfulness of the statements, it's mainly exploratory research. (Kumar, 2005, p. 8-13)

We collected data by doing face-to-face research, by writing down the visitors' opinion on the statements (agree, agree to some extent, neutral, disagree to some extent, disagree). Only considering this, we would have done quantitative research. Although, we had discussions with the visitors, talked about other statements with them, recorded some of them and we had a guestbook in which they could write comments. By doing this, we also did some qualitative research and we obtained underlying thoughts.

Data collecting and processing

The visitor or a group of visitors were directed to two adjacent, but randomly picked, poles. The navigators, the students who were standing in the installation and helped the visitors, wrote down the personal data of the visitor and his or her opinion on the statement. The personal data existed of gender, age and zip-code. Originally the zip-code was making a note if people lived in a rural or an urban environment. We changed this because it seemed hard for some visitors to decide if they lived in a rural or urban environment and this took too much time during crowded moments. We also decided to guess the age instead of asking, because we didn't want to bother visitors with (too) personal questions. The raw data is processed in excel and GIS. The statistics from excel are presented in bar charts and conclusions are drawn.

Research bias

The research done in Foresea has some impurities and therefore we can't completely rely on the obtained information.

Interview-bias

The visitor might have been influenced by the navigators' unconscious behavior, such as body language and tone of voice. This can subtly influenced the visitor into giving answers towards the navigators' opinion. In some cases the opinion of the visitor might be influenced a lot, when the captain already spoke about the dangers of the rising sea-level.

Sampling bias - Inclusive bias

The group of visitors in Foresea had a narrow demographic range: most visitors had the age of 50+ (50,3% of the 91% of visitors the age is known). We can't extrapolate the results to fit the entire population. Besides that, the festival is a theater and music festival, which attracts a certain kind of people.

Also, the amount of people answering the poles is not a reliable amount of people. From the approximate 52.000 visitors, 6000 of them visited Foresea and we collected data from 2300 visitors. These 2300 visitors answered 2 poles, so we have an average of 80 people per pole.

Measurement bias

The bias caused by the way we measured is an important bias, because it can have big influences for the data.

The definition of the statements could have been better. There were some negative statements and some unclear statements. Negative statements are harder to understand and unclear statements or multi-interpretable statements causes confusion for the visitors.

Because of the 'sea of opinions', visitors could see the opinion of their visitors, which can influence their opinion. Visitors could be ashamed when they disagree with a statement, while de rest of the waterlines is hanging at the highest hooks.

Also, a lot of visitors gave their opinion together and they had to tell the navigators their opinions. It is more likely that they gave socially accepted answers when they are not alone while answering. A response we got from some visitors, was that they want to hang the waterline at the highest hook, because that was more challenging. On the other hand, there were also visitors who wanted to hang it at a low hook, because that was more easy.

Non-response bias

People with less interest for climate change and/or sea-level rise are more tempted to not participate, while people with a lot of interest (and often concerns) for sea-level rise, are more willing to participate in this project. This could make the percentage of 'agree' and 'agree to some extent' higher.

Usefulness of the measurement instrument

The installation of Foresea, was a friendly way of collecting data. The visitors of the project were already willing to do something and they were surprised when they entered the poles, that it turns out to be an interactive 3D graph (Kumar, 2005, p. 211 – 216). Following the Yerkes-Dodson law, the interactive part of the research can be a motivation for people to perform and participate: 'Performance is maximal at intermediate levels of arousal and gets progressively worse as arousal either falls below or rises above this optimum point' (Bell et al, 2001, p. 104). It is important to create an atmosphere which is stimulating and challenging, but that it's not too much for the visitor to handle. The research within the installation will be more stimulated for visitors than a survey on paper, because of the higher level of arousal. The hard part of finding a balance in the level of arousal is that this balance differs per individual.

Improvements

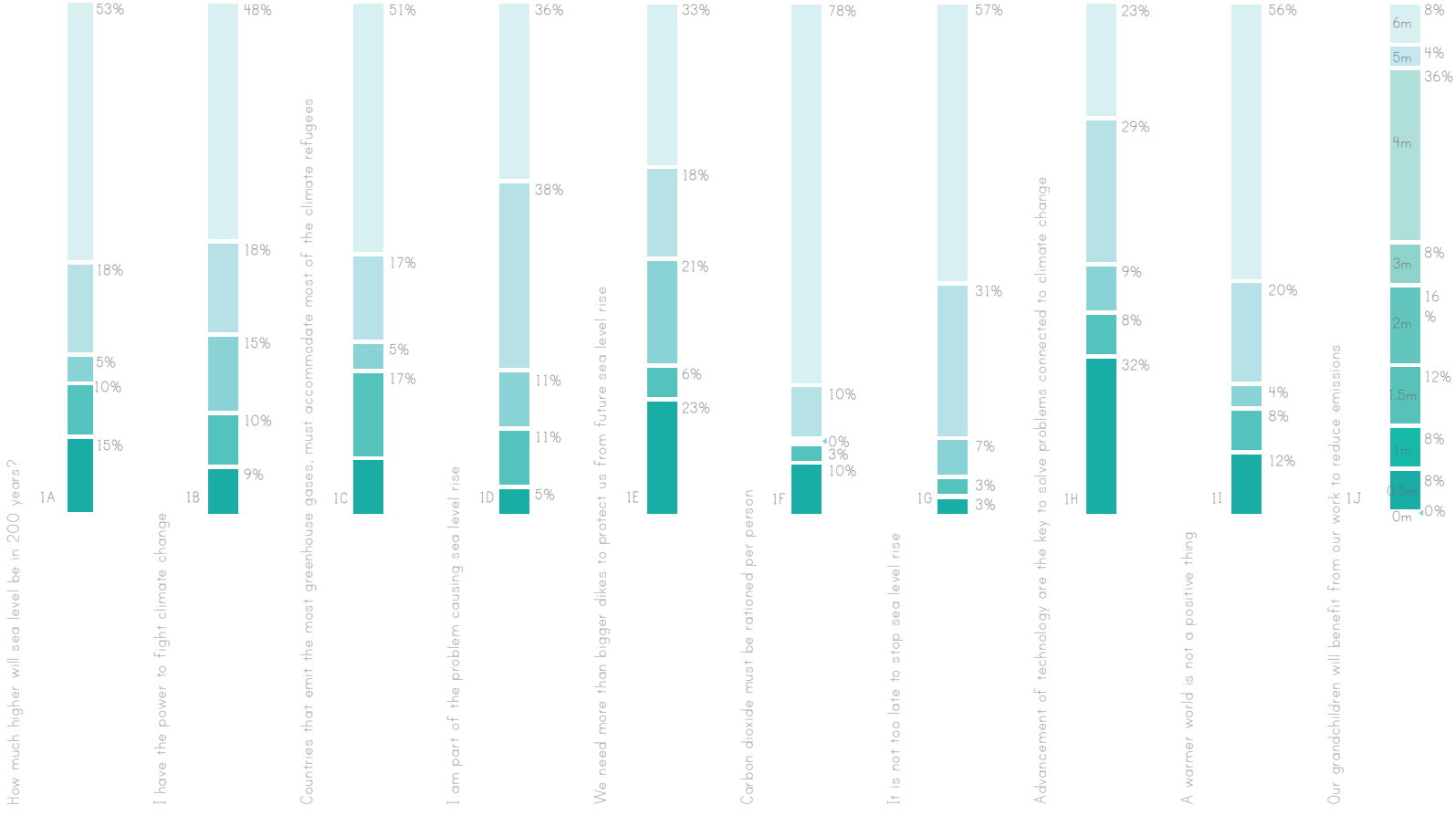
To improve the research done with a similar measurement instrument as the installation of Foresea, the following could be involved: Avoid the bias by, for example, interviewing a more diverse group of visitors, making sure all the involved people will participate, acting more neutral while interviewing the visitors, being stricter in what to tell when to the visitors, making sure all the data of the visitor will be collected, spending more time on the qualitative research, testing the statements to different people (control experiment design) and forcing people to decide to agree/disagree with the statements individually.

Sources

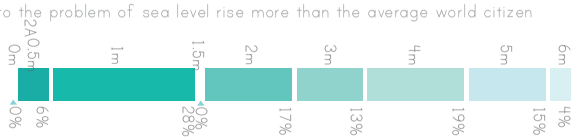
Bell, P. A., Greene, T.C., Fisher, J.D. & Baum, A. (2011). Environmental psychology. New York: Psychology Press.

Kumar, R. (2005). Research methodology, a step-by-step guide for beginners. London: SAGE Publications Ltd.

DATA


How much higher will sea level be in 200 years?
1A
53%
18%
5%
10%
15%
I have the power to fight climate change
1B
48%
18%
15%
10%
9%
Countries that emit the most greenhouse gases, must accommodate most of the climate refugees
1C
51%
17%
5%
17%
I am part of the problem causing sea level rise
1D
36%
38%
11%
11%
5%
We need more than bigger dikes to protect us from future sea level rise
1E
33%
18%
21%
6%
23%
Carbon dioxide must be rationed per person
1F
78%
10%
0%
3%
10%
It is not too late to stop sea level rise
1G
57%
31%
7%
3%
3%
Advancement of technology are the key to solve problems connected to climate change
1H
23%
29%
9%
8%
32%
A warmer world is not a positive thing
1I
56%
20%
4%
8%
12%
Our grandchildren will benefit from our work to reduce emissions
1J
6m
5m
4m
3m
2m
1.5m
1m
0.5m
0m
8%
4%
36%
8%
16 %
12%
8%
8%
0%

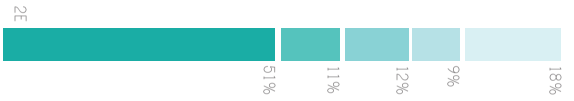
The average Dutch person contributes to the problem of sea level rise more than the average world citizen



The world needs a two-child policy to reduce overpopulation

I picture myself living in a floating city

I feel responsible for contributing to climate change when I eat meat, therefore I eat less meat



I worry about the consequences of sea level rise in 200 years

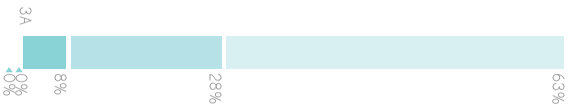
Our cities are more important than the countryside to protect from sea level rise

I worry about problems for my grandchildren caused by sea level rise

I am worried about having to abandon my home due to sea level rise

How much higher will sea level be in 100 years?

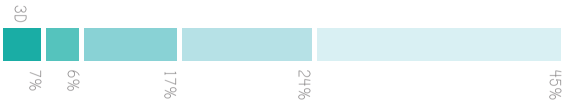
Developed countries are more responsible for sea-level rise than less developed countries



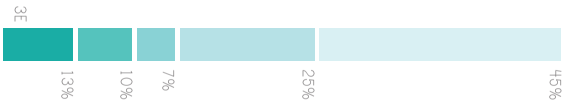
I believe that the current sea level rise is almost entirely caused by human activity

EI often worry about future sea level rise

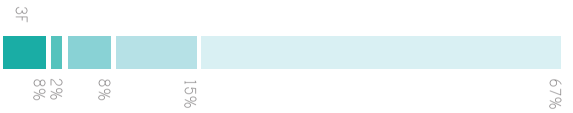
In a 100 years time, the scenario, where the Rijksmuseum will be flooded, sounds very likely



In the future, more people are displaced (refugees) because of climate change



Taxes should be used to make it easier to live a sustainable life, for example subsidising electric cars



I worry about the consequences of sea level rise in 50 years

I feel responsible for contributing to climate change when I drive my car, therefore I drive less often

Wealthy countries must economically compensate less wealthy countries for problems caused by sea level rise

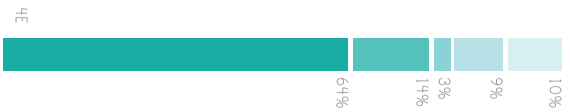
The need to adapt our behaviour to the problems of sea level rise will give us new business opportunities

I must be doing more to combat the problems of sea level rise

Extra effort should be taken in protecting the barrier islands, such as Terschelling, against sea level rise

Our capitalistic system has to change in order to tackle the problem of sea level rise

The next car I buy is a full electric so that it can be powered renewably



The average Dutch person has contributed more to sea level rising, compared to the average world citizen

We must look for other planets to live on

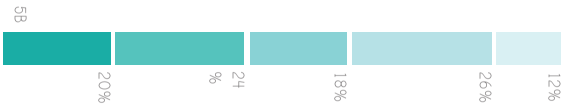
The Netherlands can handle the consequences of sea level rise better than other countries in the EU

I always buy the more environmentally-friendly product, even if it costs more

Sea level rise will have a negative effect on my life

Within 200 years a considerable amount of the world population will be living in floating cities

I think it is likely that in 200 years half of the Netherlands will be flooded



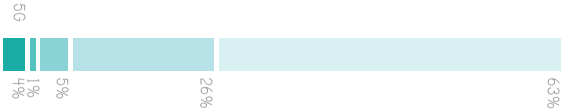
Humans are responsible for the rapid rise of global warming

We should live less luxuriously in order to stop climate change

The national flood defence budget, € 1,9 billion, needs to be increased

The average Dutch person contributes more to the problem of sea level rise compared to the average EU citizen

When the sea level rises, we will innovate our food supply and move to aquaculture and offshore farming



The issue of sea level rise must be given more attention by the media

I feel responsible for contributing to climate change when I fly on an aeroplane, therefore I almost never fly

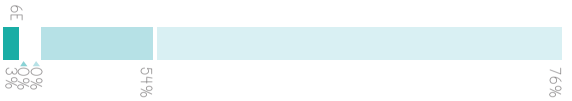
Protecting the environment is more important than sustaining our industry

Stopping fossil-fueled transportation is vital to tackling climate change

To prevent climate change, everyone must become a vegetarian

When will sea level rise affect us?

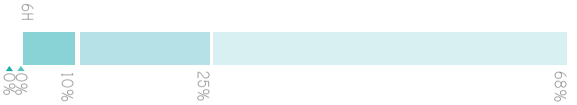
Sea level rise is the most concerning issue for the human race



I feel responsible for sea level rise

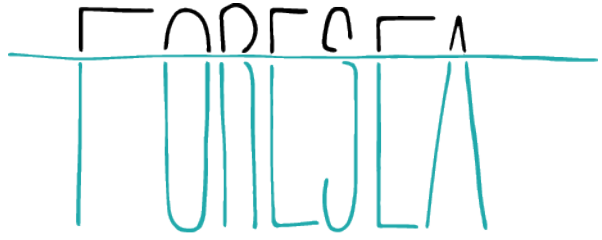
There must that be a law installed, that enforces recycling

Eating locally sourced food is vital to tackling climate change



The Dutch need to migrate to higher situated countries due to sea level rise

If I were to buy a house I consider its height above sea level as a factor that affects my decision



INSTITUTE OF PLACE MAKING

QUOTES FROM OUR GUEST BOOK

"The project has acted as a wake-up call to our consciences."

"A very beautiful installation, both in terms of aesthetics and because of the conversations that occurs. It encourages thought and action!"

"Very interesting and unique!"