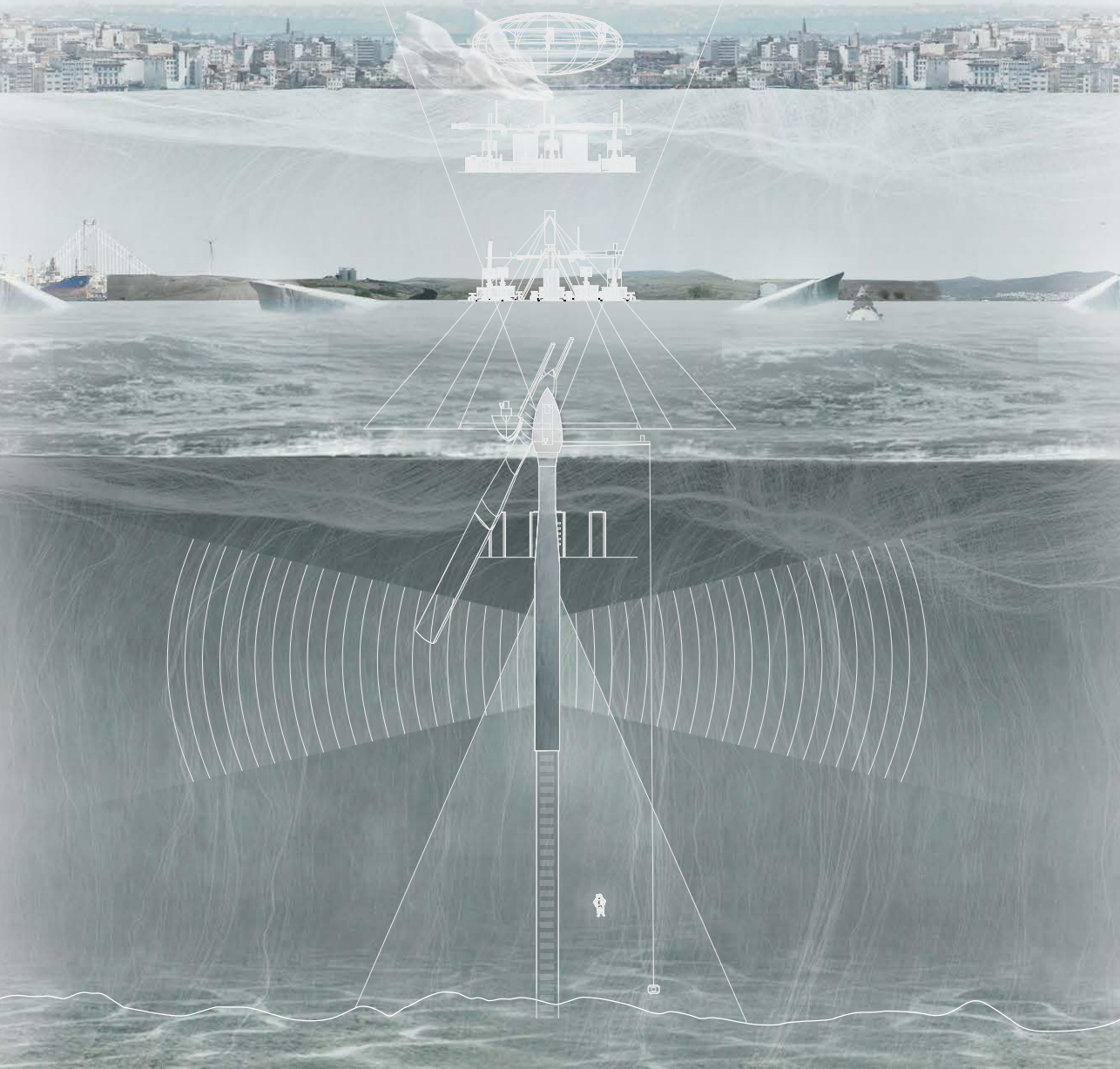
MARMARA MARINE GUARD

5 TAKES ON

A FUTURE OF OCEAN STUDIES

Carmen Wientjes

Borders & Territories
Graduation 2022-2023



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“There can be no doubt that a laboratory capable of great things for biological science, might be built at San Diego.”

- William Ritter to the San Diego Chamber of Commerce

THE VERY FIRST ESTABLISHMENT OF A MARINE BIOLOGY STATION

Image: Scripps Oceanography campus in 1925

William Ritter joined the faculty of the University of California Berkeley in 1891. Fascinated by the vast unknowns of the oceans, he immediately set out to find a place where he could easily collect marine life specimens while leading summer classes. He finally settled on San Diego.

Until 1942, those who received their doctorates from Scripps were officially graduates of UC Berkeley. Afterward UCLA conferred degrees upon all new doctorate holders, including Munk, who received his in 1947. The affiliation with UCLA would remain until 1960 when UC San Diego came into existence with Scripps Oceanography as an academic department.
The end of war meant a new mission for Scripps. Its relationship with the Navy and an abundance of no-longer-necessary ships gave the institution the means to build a fleet and support more seagoing operations. The institution’s focus changed from research with military applications to more fundamental understanding of the oceans funded primarily by the National Science Foundation. A former Scripps postdoctoral researcher, Roger Revelle, became director of the institution in 1950 and led Scripps through a period of remarkable discovery.

It was during this postwar period that Scripps biologists developed methods for collecting fishes from unprecedented depths, geologists made the fundamental discoveries that led to plate tectonic theory, scientists made an attempt to drill a hole that reached Earth’s mantle, and one of the strangest research craft ever invented, FLIP, was built.

Understanding territory through sea conditions

Shifting border conditions along the coastline

Essay
Carmen Wientjes

Introduction

In this essay three themes are adressed regarding water in relation to human and land. In the first chapter a general introduction is given into urbanization processes and its effects on surrounding water conditions and is linked to an understanding of Territory. In the second chapter the Border condition between land and water is discussed as rather a zone, an edge zone instead of a harsh line. The third chapter is dedicated to notions of reading the ocean, where the Oligopticon is introduced. Each chapter is closed with a contextual example. These three themes are the themes that serve as a guide for an archietctural response. In this essay they are discussed in a seperate manner. It will form a lense through which the Sea of Marmara can de disected into its conditional factors. AHow can the relation between human and sea be understood or redefined? How can architecture be a medium to translate these factors?

Salacak Public Seabath (1875)

1
TERRITORY

Human relation to water ecosystems

In this paragraph a small glimpse is given on the human positioning towards ecosystems. In Corboz discription of the land in relation, which he wrote in 1983, he mentions the land not as a given commodity, but a result from various processes. On the one hand there are spontaneous transformations that bear witness to terrestrial morphology. Systems we do not seem to have a direct influence on. On the other hand there is human activity that turns the land into a other cycles of remodeled space. Both influencing eachother into new cycles of being. Once enough time would have passed, and enough generations will have passed, the idea of 'nature' would not be distinctive from before that human interaction would have acted in it. Here, 'Nature' then is formed out of human activity and natural processes that together work into new ways of everchanging. Through a more in-depth perspective into ecologies with the help of, amongst other things, environmental sciences since the end of the 20th century, we have gained a better understanding of the impact of urbanization and industrialization on ecosystems (Forman, 1986). As Belanger states 'We can no longer isolate ourselves from the consequences of the process of urbanisation'. In his 'Landscape as Infrastructure' he gives the example of the areas around the Great Lakes in North America that in the 70's were the industrial centres of North America. Nowadays they mark one of the most contaminated areas in the region and are left behind with a landscape of industry, pollutants and decay (Kirkwood 2001). Another example he mentions is the Love Canal between the upper and lower Niagara Rivers, built by William T. Love. This canal could first, amongst other functions, be used as a swimming basin by the population that lived around it. At the start of World War I its usage became a weapon dump, and it simultaneously became a chemical dump in 1942. After the area was closed of and recognised as former dumpsite, it became the location for a small neighbourhood during the baby-boom period. High rates of illnesses and birth defects were registered in the second half of the 20th century.

In the case of the Marmara region, through the change and evolution of the waterfront and industrialisation of the area, the changing relationship between the sea and the human becomes apparent. Throughout the last centuries the environmental water conditions of the Marmara sea and Istanbul strait have become unliveable for the human body to be in or close to. We move our way along the water and over it for means of transportation, but no longer in it. So it goes for most of the biodiversity in the sea. To illustrate the changing relationship between human and water, The phenomena of the seabath is used as an example. The water front of Istanbul at the end of the 19th century and beginning of the 20th century once contained public seabaths on multiple locations along the Bosphorus, Golden Horn, but also along the coastline of the

Marmara Sea. In the illustration on the left most of them are shown along the Bosphorus. The concept of the seabaths was borrowed from the french 'Bains de Mer': wooden constructions that framed a part of the sea connected to the shore through a pier (see image on the rightside of the last page). The wooden construction prevented bystanders from looking through it for privacy reasons. The sea baths were of a time when the Bosphorus had no environmental or bacteriological problems and were considered therapeutic and an essential part of public health. The location and usage of these structures was an indicator of the socio-environmental conditions of that part of the city or coast (Sert, E. 2020). The seabaths later became the places where one could find the famous plajes, and some coastlines got fully detached from the public through the construction of roads during the industrialization in the 20th century to transport cargo products from harbours over the land.

In a way, the water, or better to say, the ocean is the place where we can read the consequences of what happens on the land. Through our waters we can read our societal and environmental values. I 'Dark ecology' Morton states: 'The oceans, the unconscious of the built space.' Morton deflicts the current concepts of how we perceive 'nature' and redefines it, in a rather joyful way. We have come to an objectification of 'Nature' and in that manner distanced ourselves from it. As if we would have put the phenomena on a pedistole, isolating ourselves from it. In this new view of 'nature' or rather 'ecology', the one entity, can not be over- or undermined by the other thing, so must be irreductionist based on an object-oriented ontology. The base for this comes down to the idea that entities, exist outside of the human perspective and everything on this planet exists out of its affiliations between particles, though that does not mean that all objects are equally dignified, as that seems to be a great misconception that people have to this theory (Graham. H.). Through this understanding, phenomena such as climate change, are reduced to the emergent properties of its parts, climate change is then seen as a hyper-object. All parts equally influence eachother: an entanglement of responses, relations.

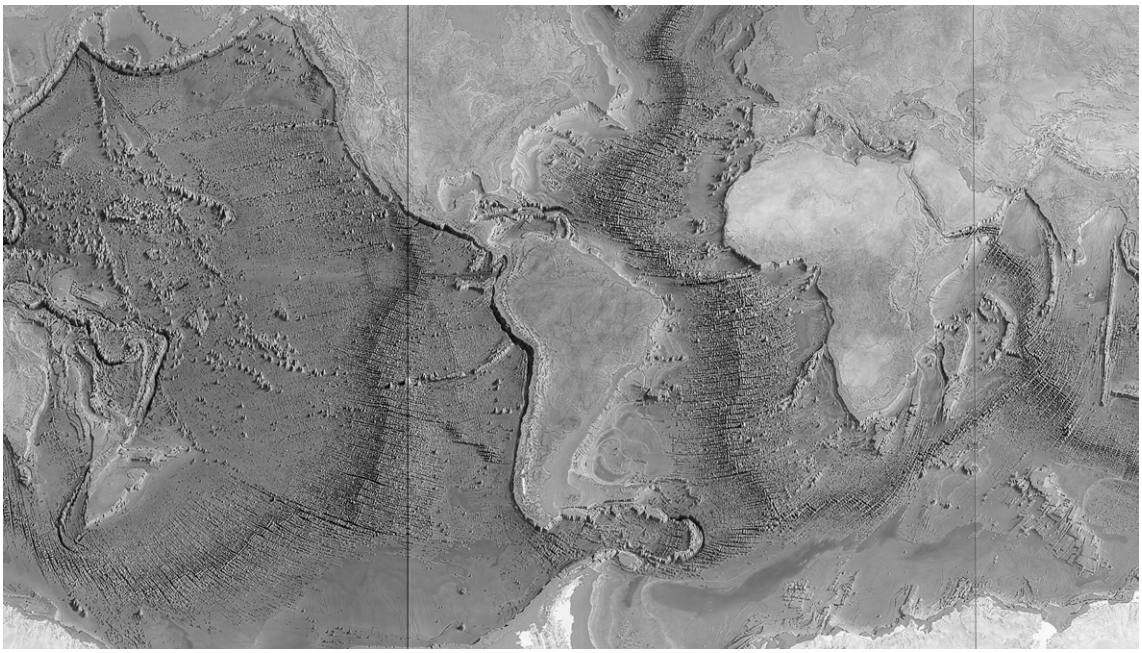
The oceans, the unconscious of the built space.'

2
BORDER CONDITION

The edge zone between sea & land

Looking at the border condition between land and sea, as In 'Border conditions Marginal Urban areas' J. Bloomer, architect and author, adresses the border condition between land and sea, not as a harsh line but as a continuous zone. In contrast to Kevin Lynch in 'Image of the city', who understands the 5 achetypal elements of where the city is made out of as very linear phenomena, such as the edge, the node, the landmark, Bloomer describes territories not as edges or harsh cuts, but as interrelational edge zones. she gives the example of the beach, where it becomes clear that the edge of land and sea is neither any of those things, but both. The seas edge as an imaginary phenomena, that is made out of a interrelatonal zone of life, that knows noe end or beginning, as the sea does not.

'The edge of the sea – that skittering, rolling, splashing, salty, translucent blue-green foaming non-thing – is impoverished in representation: a line on the map, graphically indistinguishable from any other lines drawn on maps.' (2010) Through new understandings of the non-linearity of the border between land and sea, new insights can be given to us about our oceans. In the past, discoveries about the border-condition between land and sea have led to new technologies and sciences. From the first mappings of the ocean and its sea life to the first time the ocean floor was mapped, our behavior towards the phenomena changes with the perception we have of it. When we



View from the Cascade, 2017

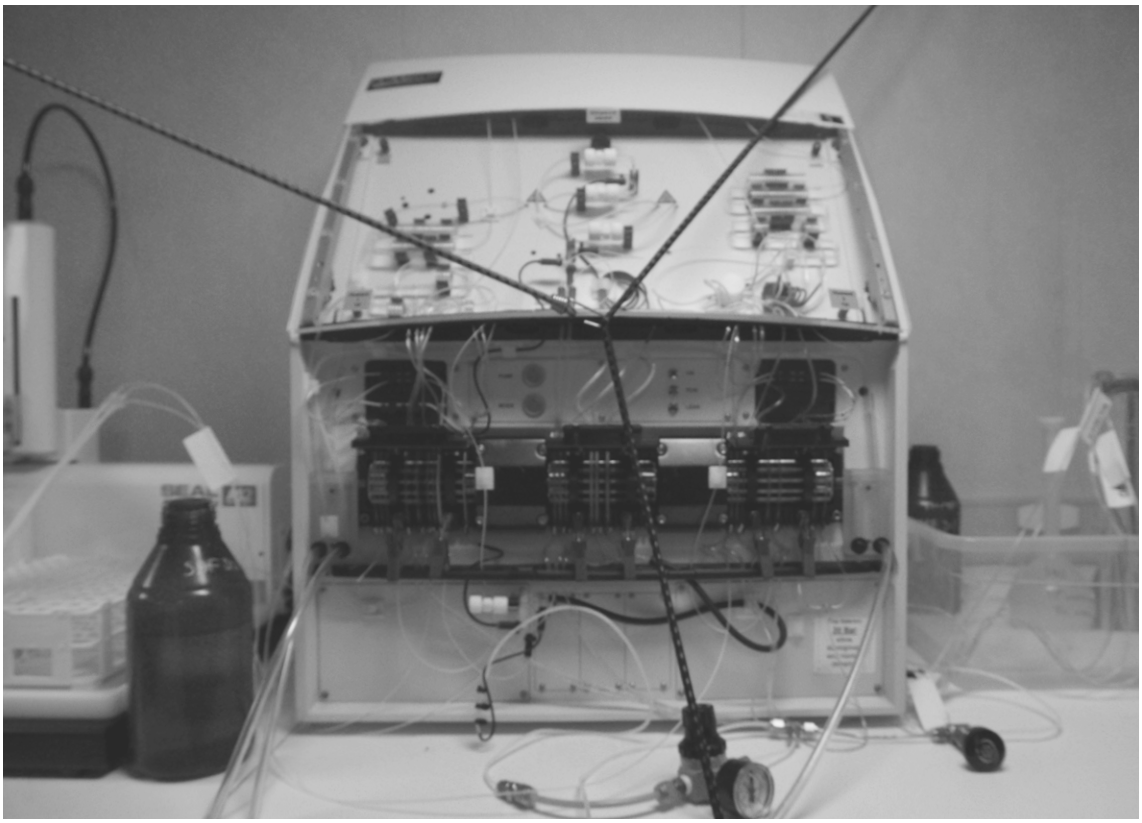
look back at the first time the world ocean floor was mapped by American scientist and oceanic cartographer Marie Tharp and her colleague Bruce Heezen from the Lamont-Doherty Earth Observatory this becomes apparent. The duo created the first map of the ocean bed floor through interpretation of rhythms of the earths surface, and in that way they discovered a rift valley along the Mid-Atlantic. This map later confirmed theories of continental drift and led to the base of new research areas.

3
THE OLIGOPTICON

Monitoring the sea

'Paris Invisible' by Latour describes the city of Paris through different oligoptica, supported by photographs. His oligopticon is opposing the panopticon (panoptes: 'all seeing') by Jeremy Bentham, dating back to the 18th century. Water, electricty, different sciences, all have their own oligoptic lense: control rooms or spaces where one can understand macro phenomena through a look into the micro. One can only see little at that moment, but through seeing that specific selection of a system one can make more sense of the bigger whole. In Plan 21 of Paris Invisible, the 21st of 53 stories, he discusses the oligopticon of the lab, with the example of astrology. The Astrophysics Institute is a place where data is obtained of the galaxy, the place where they hold the instruments to point at the sky and measure phenomena. These measurements then get translated to different factors that then determine the weather forecast or share with us data about the local polluted air, that then get published in the newspaper. For the astrophysics institute to know where to point their instruments at, not to wonder without direction, the astronomer would have had to ask Simbad for the list of specific galaxies to point their telescope at, to not gaze at the sky without direction'. Different specializations, a network of oligoptica, that form an image of what we, as regular citizens, see in front of us is constructed, but a network that can tell us more about what we see than what we could ever see without. 'The sky – galaxies, pulsars, dwarf stars, stars, planets () There's no way, we now realize, that we can grasp the structure of the universe by looking up at the grey and polluted skies of Paris. On the contrary, we have to focus on channels through which the entire sky moves in the form of a dual series of adjustments () These days we see clearly only if we look at the phosphorescent light of some computer screen.'

The Sea of Marmara, a sea with a highly industrialized

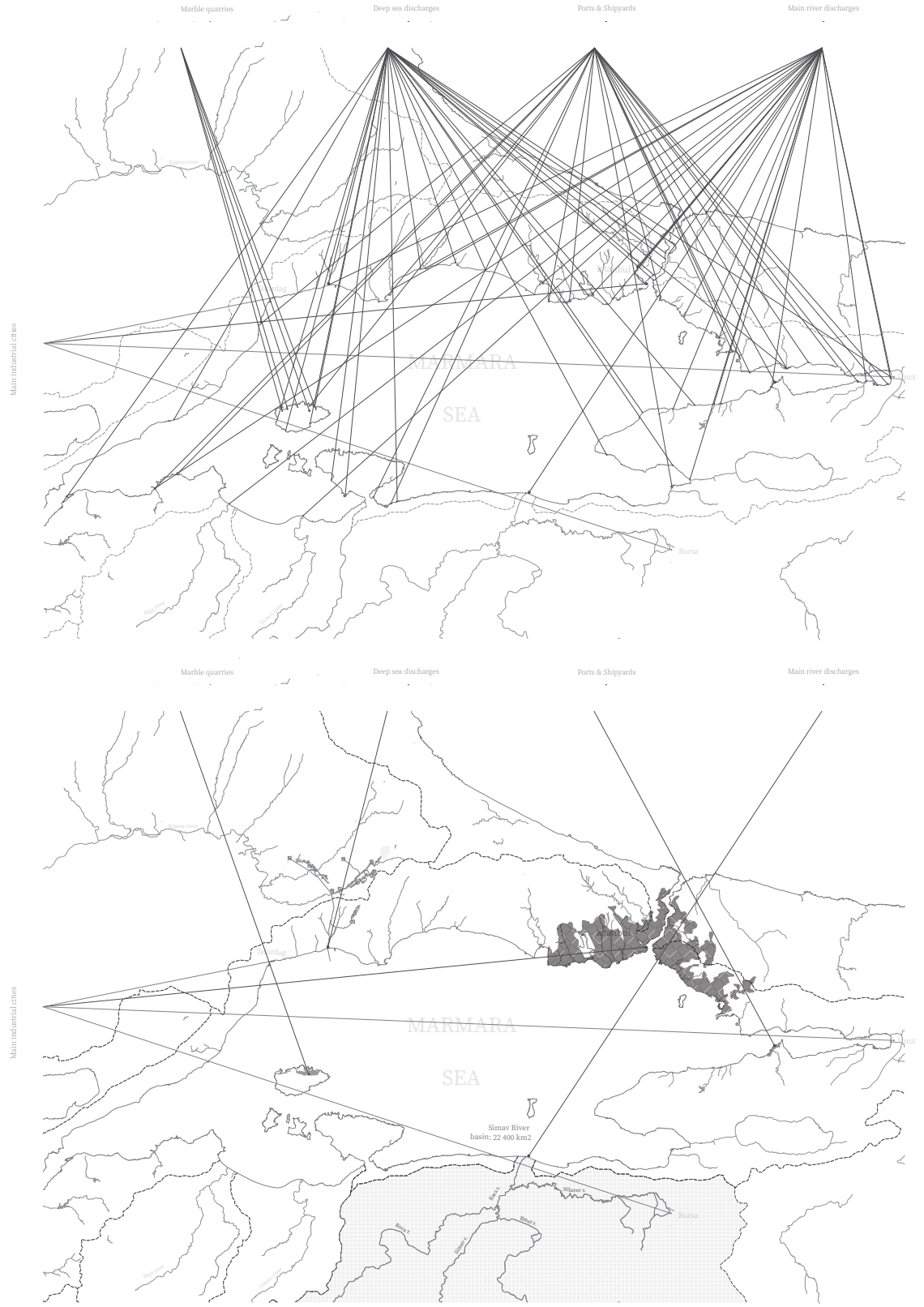


waterfront, is dealing with many pollutants since the industrialisation and urbanisation of Istanbul and the surrounding region and the sea conditions are being monitored and studied on a frequent basis. Through different apparatus different values of the sea are measured and then used for research and communication. Oceanographers, biologists and other fields work together from their main institute near Gebze (in between Istanbul and Izmit bay) and conduct their field research through frequent sampling by boat around the Sea of Marmara, Istanbul strait and Dardanelles strait, studying the Black Sea, Aegaen sea and mainly the Sea of Marmara, as they directly impact eachother.

Conclusion

Three themes regarding the human understanding and relation of the sea are brought forward within this essay in relation to Territory, Border condition, and Oligopticon. Architecturally these serve as tools to come to an architectural manifestation within the Marmara sea region to respond to the conditions:
The changing milieu or increasing pressure of the Marmara waters and the human socio-environmental relation to it, the reading of the water through places of research, and the disecting of coastline and natural processes though its multiplicities and entanglements.

Nem rendit ius derio


Marble quarries
Deep sea discharges
Ports & Shipyards
Main river discharges
Main industrial cities
MARMARA
SEA
Bursa
Marble quarries
Deep sea discharges
Ports & Shipyards
Main river discharges
Main industrial cities
MARMARA
SEA
Simav River
basin: 22 400 km2
Bursa

1979 Shipcrash MT Indepenta, Bosphorus, Istanbul

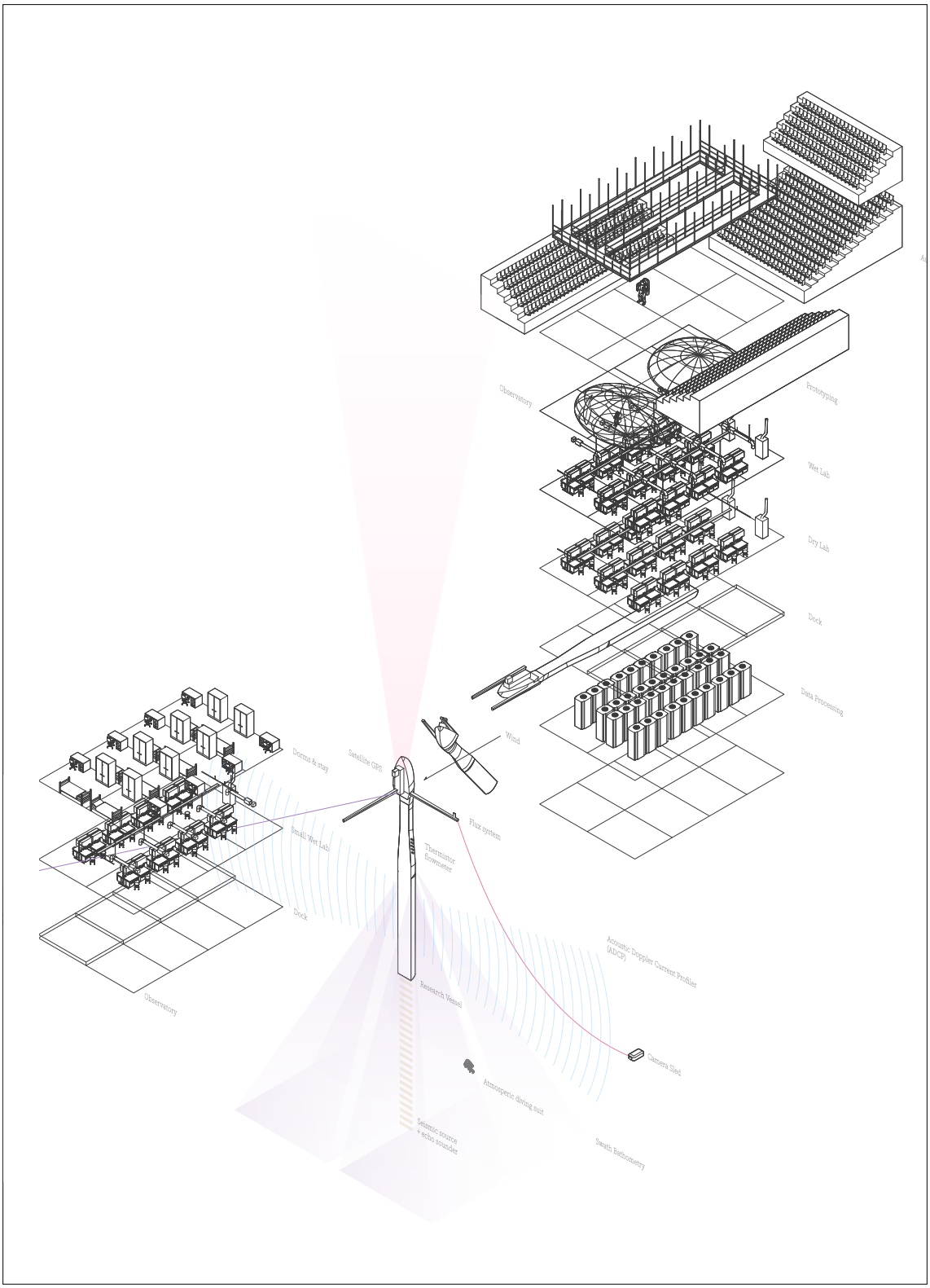
INTRODUCTION

Istanbul & Marmara region through the lense of sea water pollution

Within the city and coastal regions of the Marmara Sea a detachment between human and oceanic waters is taking place through the pollution of the Sea by the post-industrial anthropogenic processes put on the sea and the hinterland of the area. Large-scale pollution has led to a mucilage plague (2021) in the waters causing a thread to marine life, from the scale of the Golden Horn to the scale of the Marmara Sea. The mucilage, better known as algae bloom, makes the pollution visible on the surface waters, and shows itself along these places where people flourish along the coast or docks in urbanized areas such as Istanbul. Istanbul itself forms the largest cause for the pollution occurence, though the causes of pollution are part of a terretorial scale.

SUBTITLE

In this project the pollution and instrumentalization of the Sea of Marmara by the urban region of Istanbul and its hinterland, is adressed. The water conditions form a reflection of the activities on land. This project tries to remove the border between land and water, making the activities in our oceans visible. The project aims to enhance



'A network of Marine & Ocean studies in axonometric

 Process in sequence: 1. RV sampling, 2. on-site laboratory work, 3.education & processing

the importance and societal value of the oceans wellbeing. The importance of knowledge on the topic has been recognised by the United Nations with the proclamation of the Decade of Ocean Science for Sustainable Development (2021-2030) as the ocean is vital for human health, climate, biodiversity, the food chain and nevertheless is connected to our economy. However, due to increasing anthropogenic impact such as nutrient flows, CO2-emissions, and other pollutants the ocean is rapidly changing. Through architecture can a new light be shed on the marine sciences that form a key player in maintaining the oceans. New approaches need to be explored to find or alert the relation between territorial conditions and sea conditions.

UNDERSTANDING TERRITORY THROUGH MARINE STUDIES

On the image on the left the system of Marine studies is expressed in an axonometric. From sampling, to on-site llaboratories, to educational purposes. There is a distinction made between dry labs, wet labs, room for data-processing, ROV prototyping, educational facilities, accomodation on site, and room for docking. On the map below the current sample locations of different parties is collected. A new system that is proposed, that can facilitate this research further.

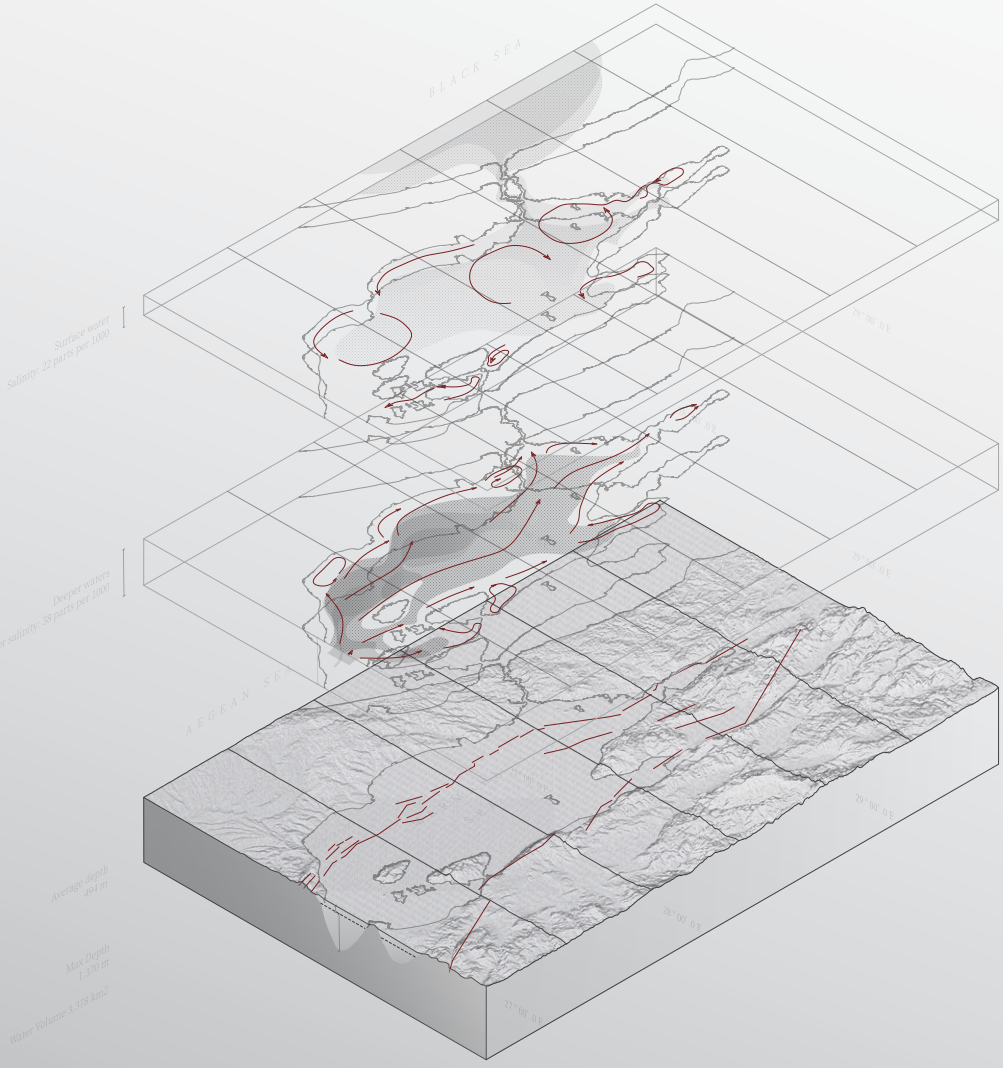
Current sample extractions
Sea of Marmara


A process of Seasnot occurence
Section of Golden Horn, Bosphorus & Marmara Sea
1.
Undisturbed marine life
Wide variety of sea life due to
nutrient-rich top current
& high salinity in bottom current
2.
Effects of Climate change
& temperature rise
to changed biodiversity and increase bacteria
GOLDEN
HORN
BOSPHORUS
CO_2
Cyanide
Nitrogen
Chromium
Lead
Copper
0
30
PHOTIC
200
DISPHOTIC
Average depth 496
1000
APHOTIC
Max depth 1396
Dolphin
Turtle
Sword fish
Blue fish
(groupers, such as sardines)
Octopus
Sting ray
Jellyfish
Crab
Corals
Sea sponge
Microbial growth
Precipitation
Rising temperature
N_2
Nitrogen increase through discharges
P_4
Phosphorus increase through dischar


1989
2021
Seasnot plague
Istanbul, Marmara Sea
3.
Interruption by pollutants
Increase of microbial growth and
subsequently an algae increase
4.
Seasnot occurence
5.
Polluted interrupted balance
MARMARA
SEA
3 - 4 months
Suffocating
blanket
O_2
O_2
Spread of
bacteria & viruses
Algae
increase
Pathogen
increase
Clogging of gills
Decrease biodiversity
7 - 10 years
Death
Coral bleaching
Decrease organic matter
Evaporation
Phytoplankton

The Sea of Marmara


BLACK SEA
CINARCIK
BASIN
IZMIT
BAY



AEGEAN SEA

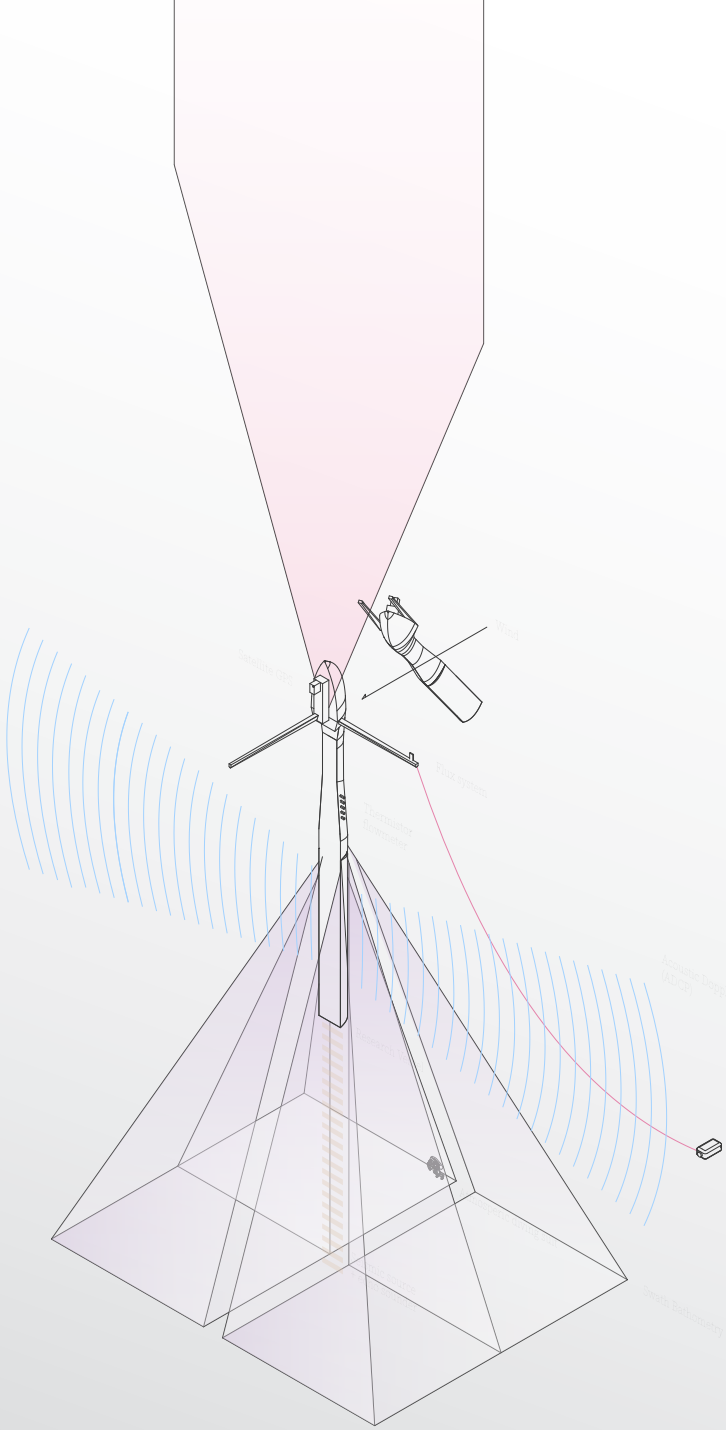
MARM

30 cm

Height differences of surface water in relation to neighbouring seas

Formation of the Sea of Marmara

Scientists like to refer to Noah's Ark theory



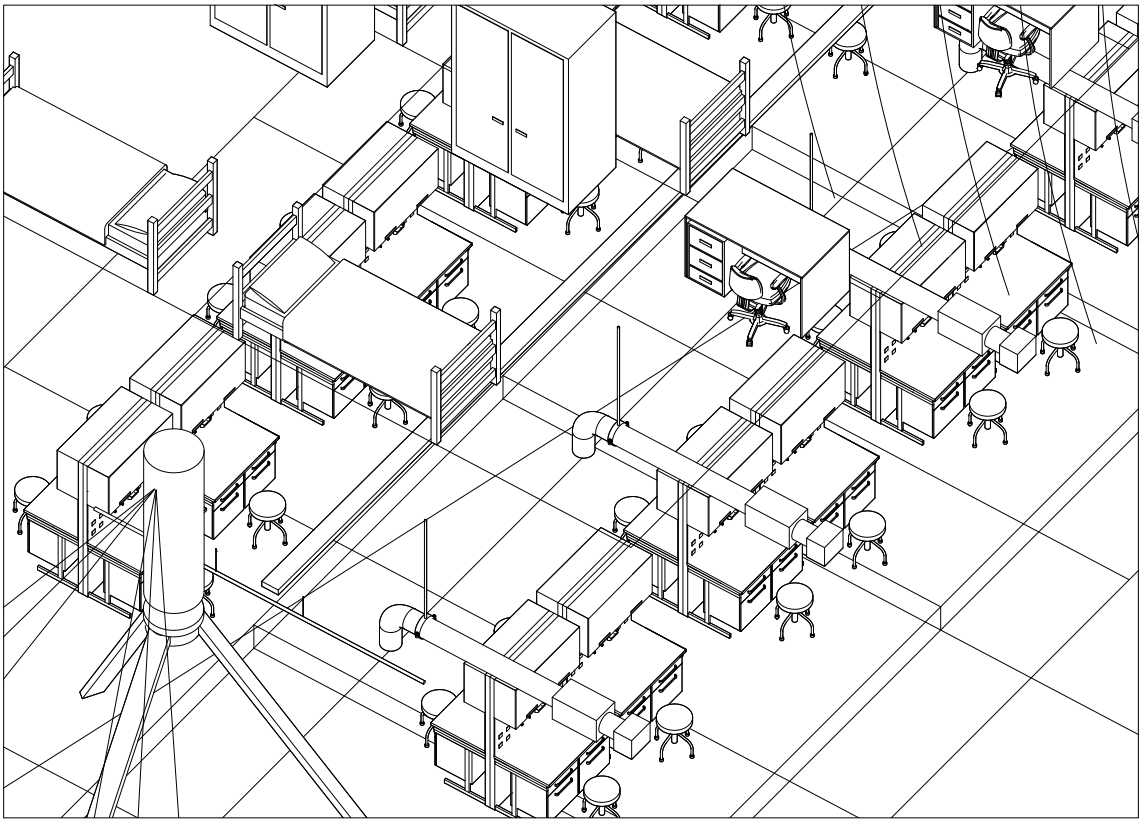
ARA SEA

BLACK SEA

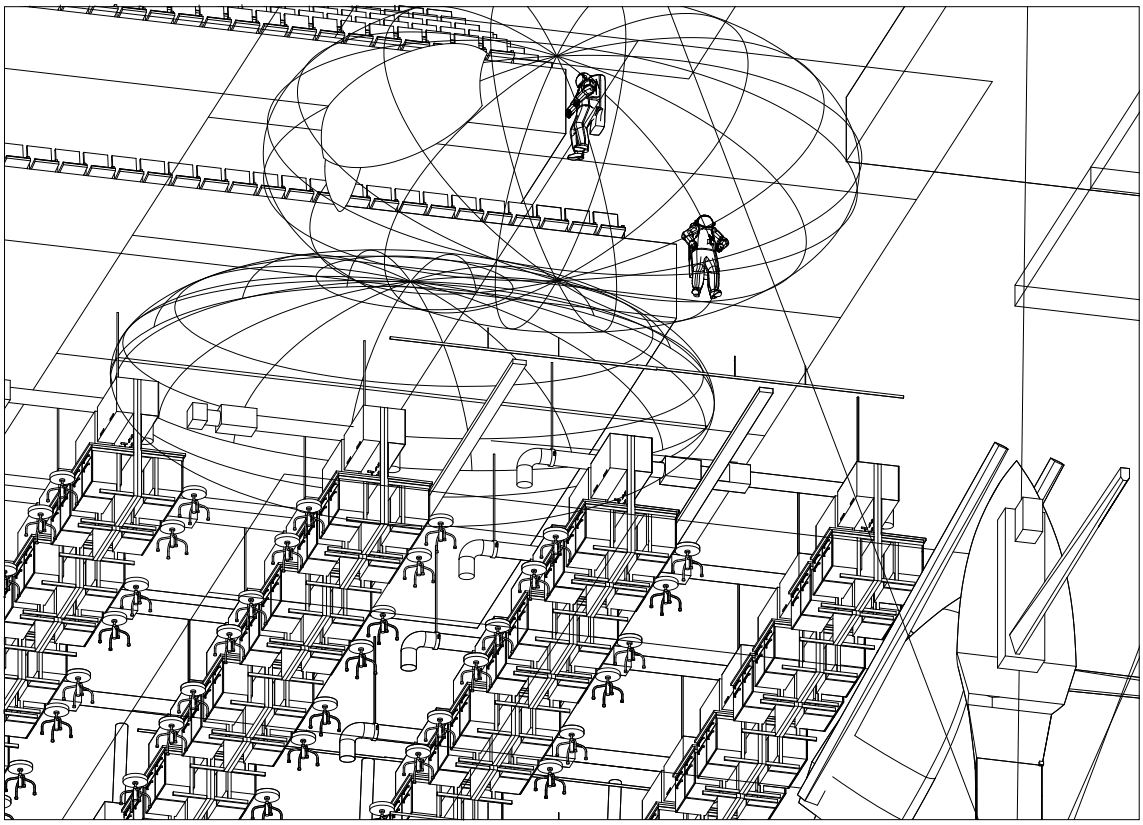
40 cm

'How a FLIP-ship works'

exploration of a marine RV: The monitoring & sampling that form the base for further lab work



'An on-site laboratory'
exploration of programmatic functions



'A main institution of oceanography'
exploration of programmatic functions

Legend

1 : 7000 (70m)

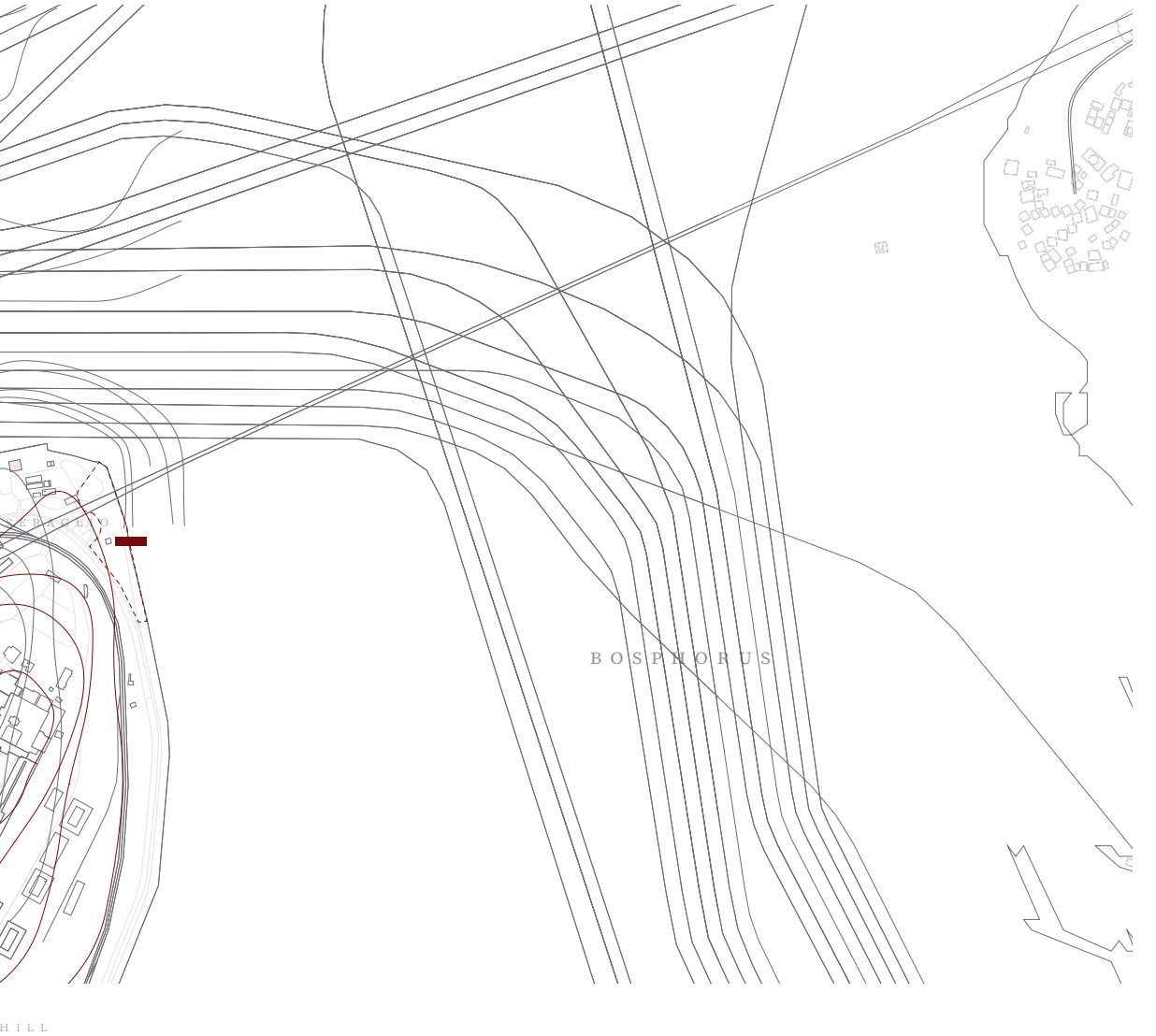
0 7000 14000

Ferry routes
Height line
Bathymetric height line
Road
Old city wall

Building
University campus
Label site

1 Istanbul University Institute of Marine Sciences and Management

2 Istanbul University Institute of Aquatic sciences

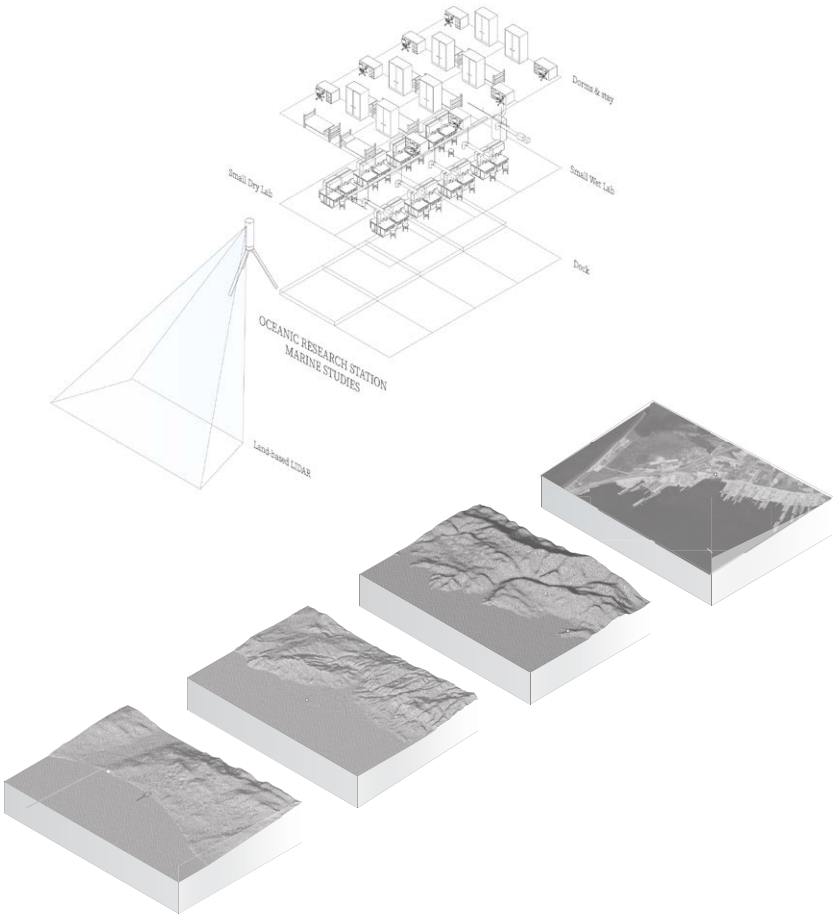


A PLACE FOR A CAMPUS

The main institute wil be located on the very crossing of the bosphorus, golden horn and Marmara Sea, in the old centre of Istanbul. From here the institute will have easy access to all the waterways and from here will be on a proximity from Istanbul university campus. Seraglio-point, a point from where the old-Byzantium has grown from. On the map above the three hills are indicated from which Istanbul originates.

Seraglio-point from the water's perspective, is the entrance point of Istanbul, and the start of the Sea of Marmara.

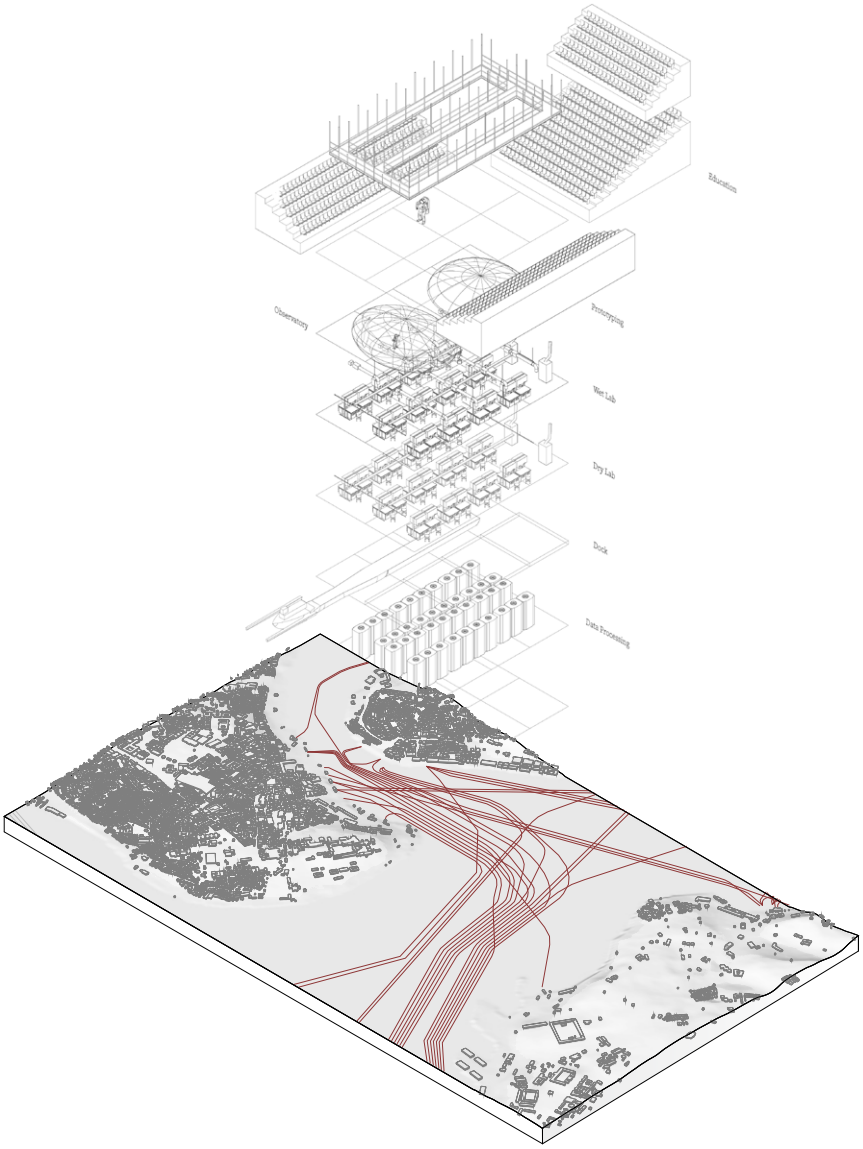
A division is made between two types of buildings Together they form a symbiotic unity of five in total. A system.



1. Tekirdag (Tekirdag basin)
2. Simav River estuary (Gulf of Erdek)
3. Marmara Island (Central basin)
4. Shipyards (Izmit bay)

PROTOTYPICAL ON_SITE LABORATORY UNIT

Each small on-site laboratory station covers a different zoning of the Marmara sea, stationed on a place that is causing pollution. The stations feed the data and research that then comes together in the main headquarters of Marine Genomics & Oceanography in the city of Istanbul. Architecturally these stations are made to withstand extreme terrain conditions. Programmatically, one could think of on-site laboratories (wet & dry labs), accommodation for approximately 30 scientists or students, gear for field research, and space for docking.



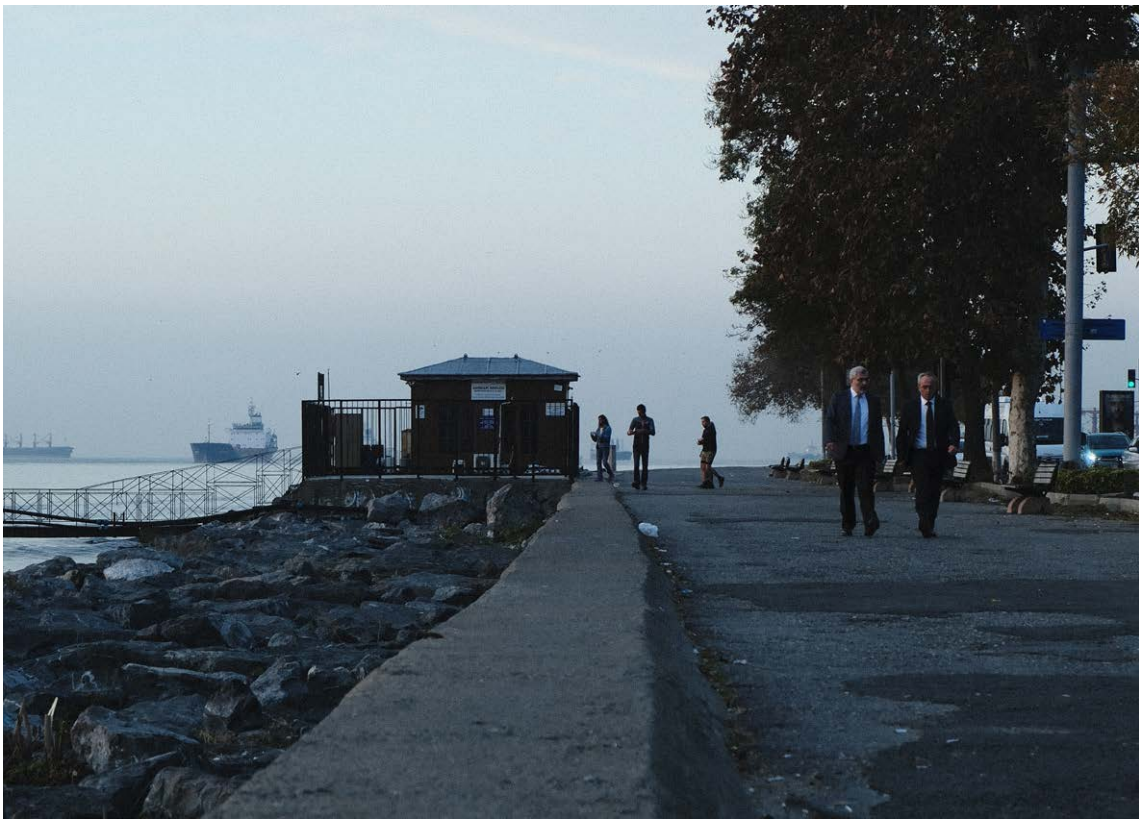
5. Sarayburnu (Seraglio Point)

Crossing of Golden Horn, Bosphorus & Marmara Sea

INSTITUTE OF MARINE GENOMICS & OCEANOGRAPHY

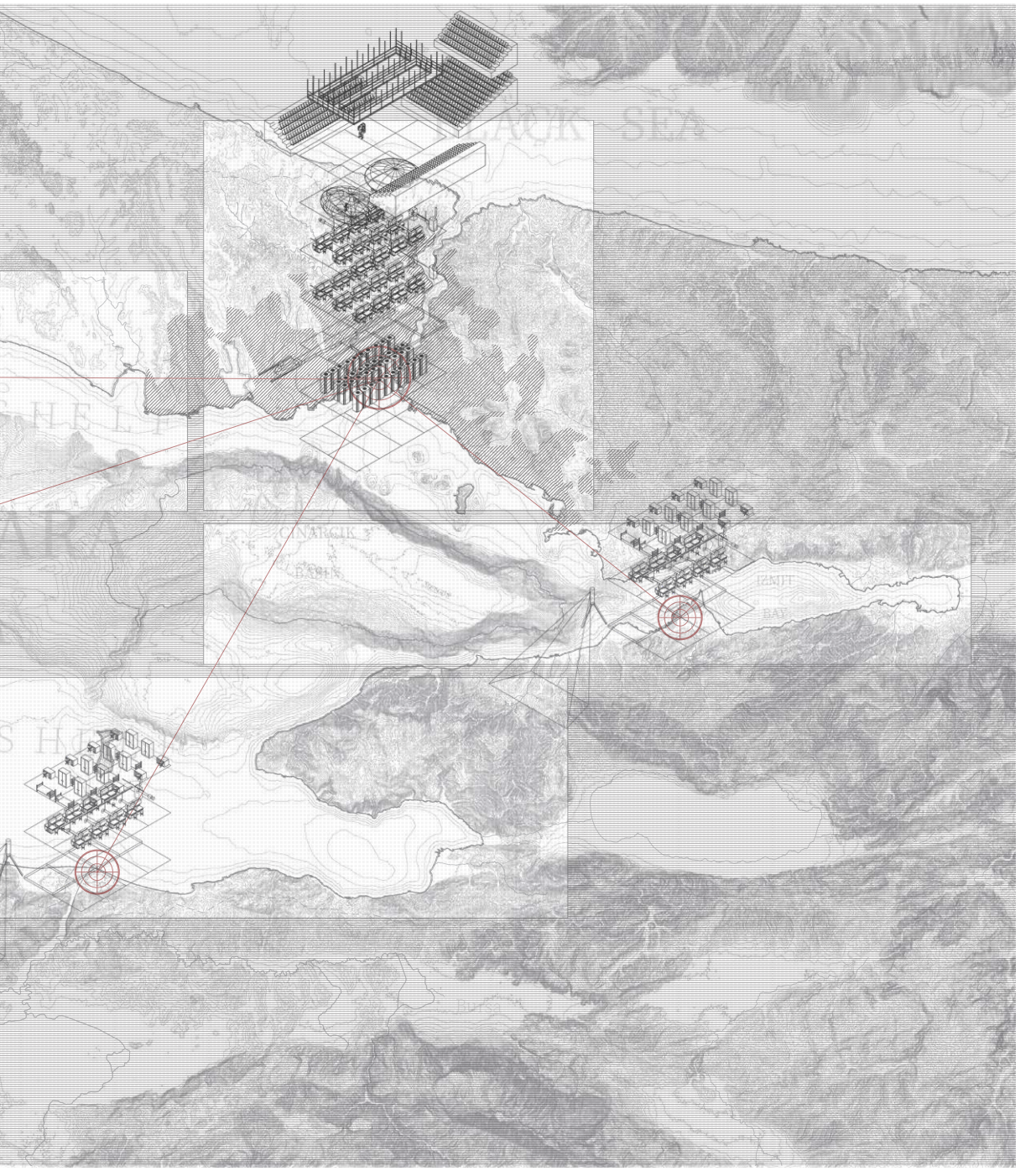
The main Institute of Marine Genomics & Oceanography embodies the collection of research and data of all smaler unites combined and contains the main large-scale laboratories, prototyping of ROV and research gears, educational facilities and forms a new on the coastline. The building that gets 'fed' by the smaller stations. This main institute wil be located on the very crossing of the bosphorus, golden horn and Marmara Sea, in the old centre of Istanbul. From here the institute will have easy access to all the waterways and from on proximity from Istanbul university.

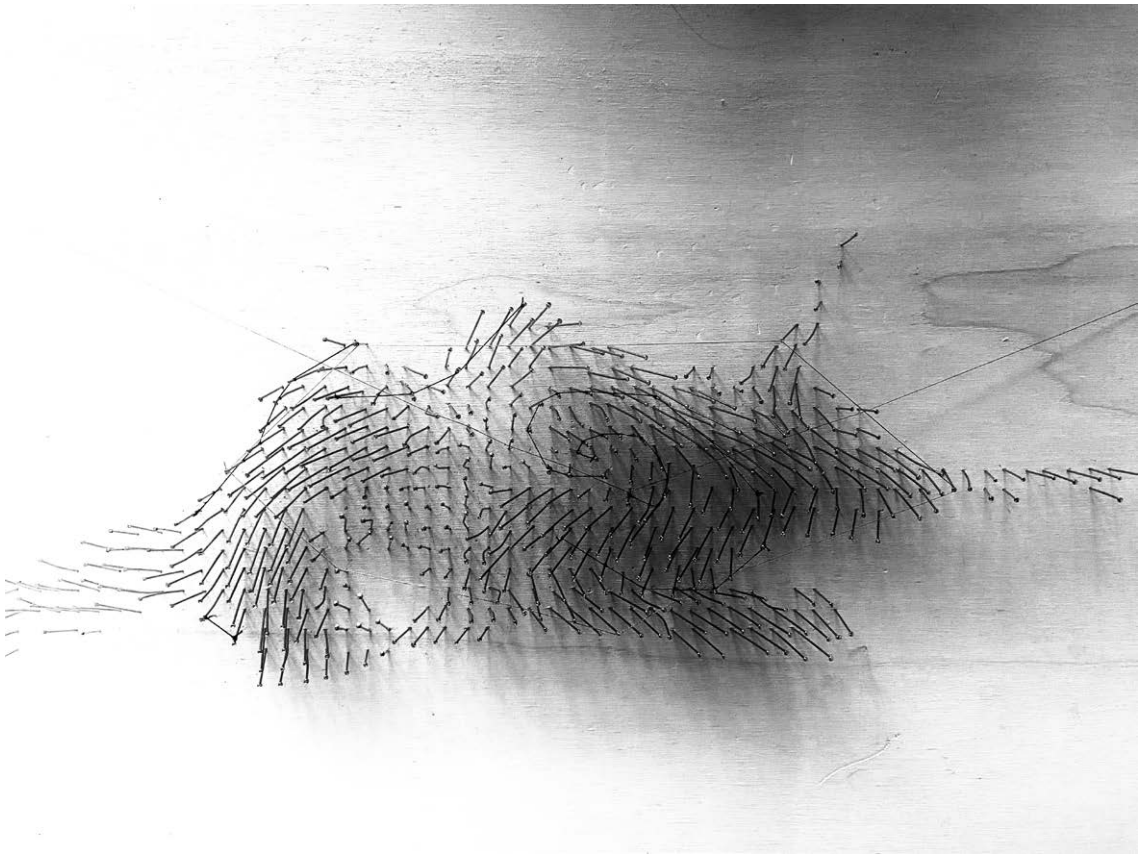

Tanıklık Eden
YBURNU



Views from Seraglio-point
October 2022

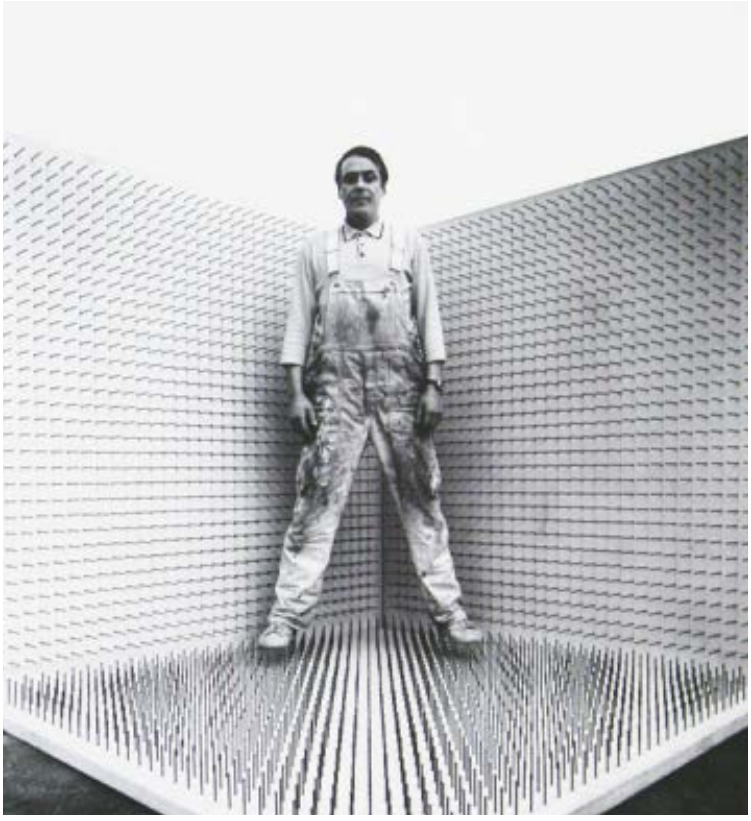
38 Proposed marine research network

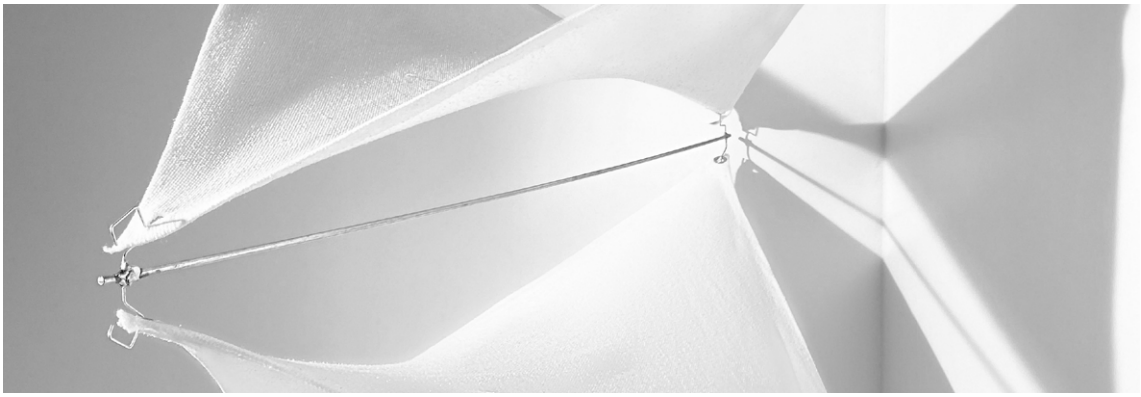


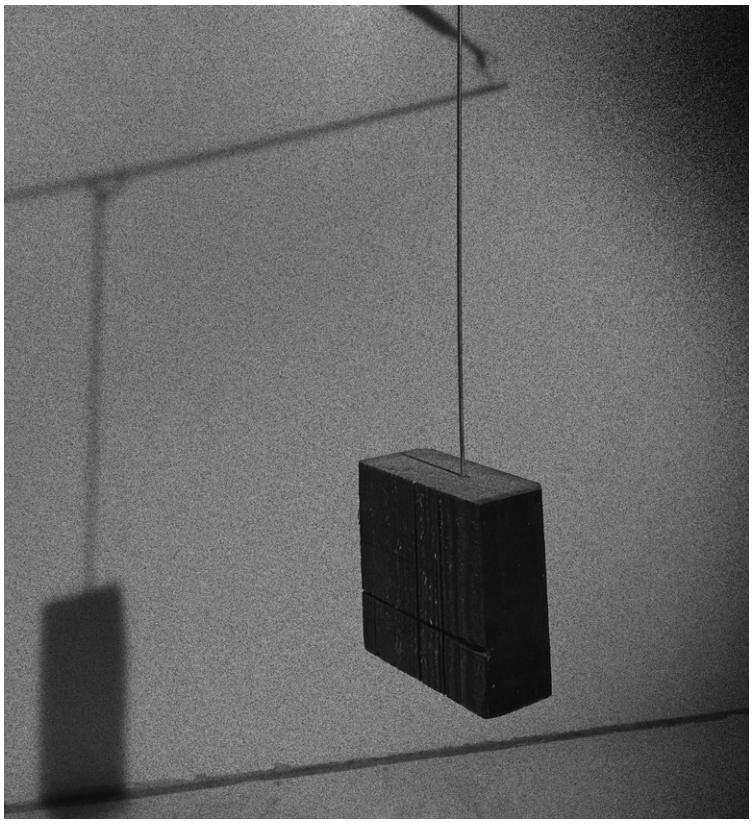


The illusion of movement is demonstrated through the use of nails, hammered in both a piece of wood and clay, the clay showing the bathymetry. The nail direction is based on the water flow of the Marmara Sea. Through the nails, the natural process of the currents is exposed, made tactile and read.

Günther Uecker (born in 1930)
German sculptor and Installation artist







MODI OPERANDI, MODEL 3

The phenomena of tension, between weight andmaterials, is demonstrated. Furthrmore the intention of structural articulation, and the working together of constructional and transformal materials, is expressed here. The object can be open and closed in the blink of an eye.
There is a response to weight, to movement. Both halves of the white body form a mirror shape of eachother and will move with eachother in a similar way once the weight would shift.

IMAGES

Front Page illustration
Wientjes,C. (2022)

Scripps Institute of Oceanography

Mucilage, or “sea snot,” covers the shoreline in Istanbul, Turkey, June 6, 2021. (AFP PHOTO)
https://www.dailysabah.com/turkey/sea-snot-spreads-to-black-sea-amid-fight-in-turkeys-marmara/news

Public seabaths
Salacak Public Sea Baths, 1875, by Kargopulo. Burçak Evren, 16, 2000.

Marie Tharp in Lamont Hall
Marie Tharp in Lamont Hall (1961). Credit to: Lamont-Doherty Earth Observatory and the estate of Marie Tharp

World Ocean Floor map
Painted by Berann, H. (1977) by Bruce Heezen and Marie Tharp
Copyright by Marie Tharp 1977/2003.
Retrieved from: Marie Tharp: The lady who showed us the ocean floors Gary W. North.

1979 Shipcrash MT Indepenta, Bosphorus, Istanbul

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Scientific essays on sea snot and mucilage in the Sea of Marmara

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