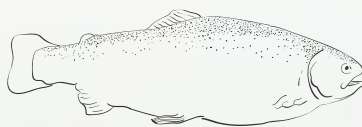


Har du hørt historien om de tre små fisk  
som endte sine dager i en fiskehandlers disk  
Og de svømte og de svømte og de svømte rundt  
for deres mor hadde sagt at svømming var sunt

**Bob bob dædi dædi bob bob suuu**  
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for deres mor hadde sagt at svømming var sunt



Julie Alvær Teigen  
Diplom 2021  
Bergen Arkitektthøgskole

**Project description**

APP: Sverre Søndresen  
DAV: Pavlina Lucas

## WHY

The aquaculture industry in Norway has been an economic success story. With the hopes of Norwegian economics depending less on oil and gas in the future, many see aquaculture as one of the industries likely to grow to take the front seat of Norwegian export. With this growth, it is reasonable to expect an increased presence of aquaculture buildings along the coast, especially with the expansion of land based aquaculture. This typology has been greatly disconnected from their surrounding contexts, and often built by companies without roots in the local communities.

## WHAT

With an aquaculture centre, this diploma project is hoping to offer a neutral ground where visitors can get hands on experience on how aquaculture is operated, but also programmes that can be used as a stage for social events for the community, as a way for them to regain the feeling of ownership over aquaculture related buildings.

Gulen akvakultursenter is an educational visitor centre that focuses on the topic of aquaculture in Norway. Aquaculture has had a big economic, but also architectural impact on Norwegian coastal communities. The architectural forms and presence of this industry is often detached from the vernacular. The aquaculture centre will serve as a space for the community, while accommodating programmes for learning about and discussing, the future of aquaculture. The form of the building will be an exploration in how the architecture related to the industry can be softer and more responsive in its conversation with the context.

## WHERE

The topic of aquaculture is one relevant to every community along the Norwegian coast. I have chosen Gulen municipality a few hours north of Bergen because the municipality once was the second largest aquaculture area in the country, and is unique today in that aquaculture is run almost exclusively by one company, resulting in a big private impact on the local economy. Additionally, Gulen was chosen as site because of my roots - I have family in the municipality on my father's side, and my network helped me in my investigation of the place, but also the social impact of the aquaculture industry and the community directly impacted by it.

## HOW

To investigate the topic of aquaculture and its cultural, economic and social influence on Gulen municipality, I conducted a survey with the inhabitants of Byrknes, one of the largest settlement in the municipality. In addition, I interviewed locals, representatives from the aquaculture industry, as well as their opposers, in attempt to achieve an unbiased perspective on aquaculture, its challenges and solutions. To develop the architectural proposal, I have relied on modelmaking, both physical and digital, as well as drawings and sketches throughout the process. The final stages of the design process has been greatly driven by landscape on site, and the intention of a minimal physical footprint.





Special thanks to:  
Ola Braanas, Firdasea AS  
Ruben Oddekalv, Norges Miljøvernforbund  
Linda Gjelsvik Teigen  
Kornelius Moan Teigen  
Survey participants for the Byrknes survey  
Øystein Teigen, exhibition build

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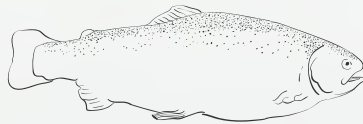
for deres mor hadde sagt at svømming var sunt

This diploma project addresses the topic of aquaculture  
and its economic, cultural and architectural significance  
for Norway, Norwegian coastal communities and coastal  
landscapes

Har du hørt historien om de tre små fisk  
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Julie Alvær Teigen  
Diplom 2021  
Bergen Arkitekthøgskole

**Diploma programme**

APP: Sverre Sondresen  
DAV: Pavlina Lucas





# Index

## Project description

<b>What:</b>	Project approach	5
<b>Why:</b>	Aquaculture	7
<b>Where:</b>	Site	13
<b>How:</b>	Methodology/approach	17

<b>Project framework</b>	21
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<b>CV</b>	23
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# WHAT - Project concept

5

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Gulen akvakultursenter is an educational visitor centre that focuses on the topic of aquaculture in Norway. Aquaculture has had a big economic, but also architectural impact on Norwegian coastal communities. The architectural presence of this industry is almost always detached from the vernacular. The aquaculture centre will serve as a space for the community, while accommodating programmes for learning about, and discussing, the future of aquaculture. The form, footprint and materiality of the

building will be an exploration in how the architecture related to the industry can be softer and responsive in its conversation with the context.



6

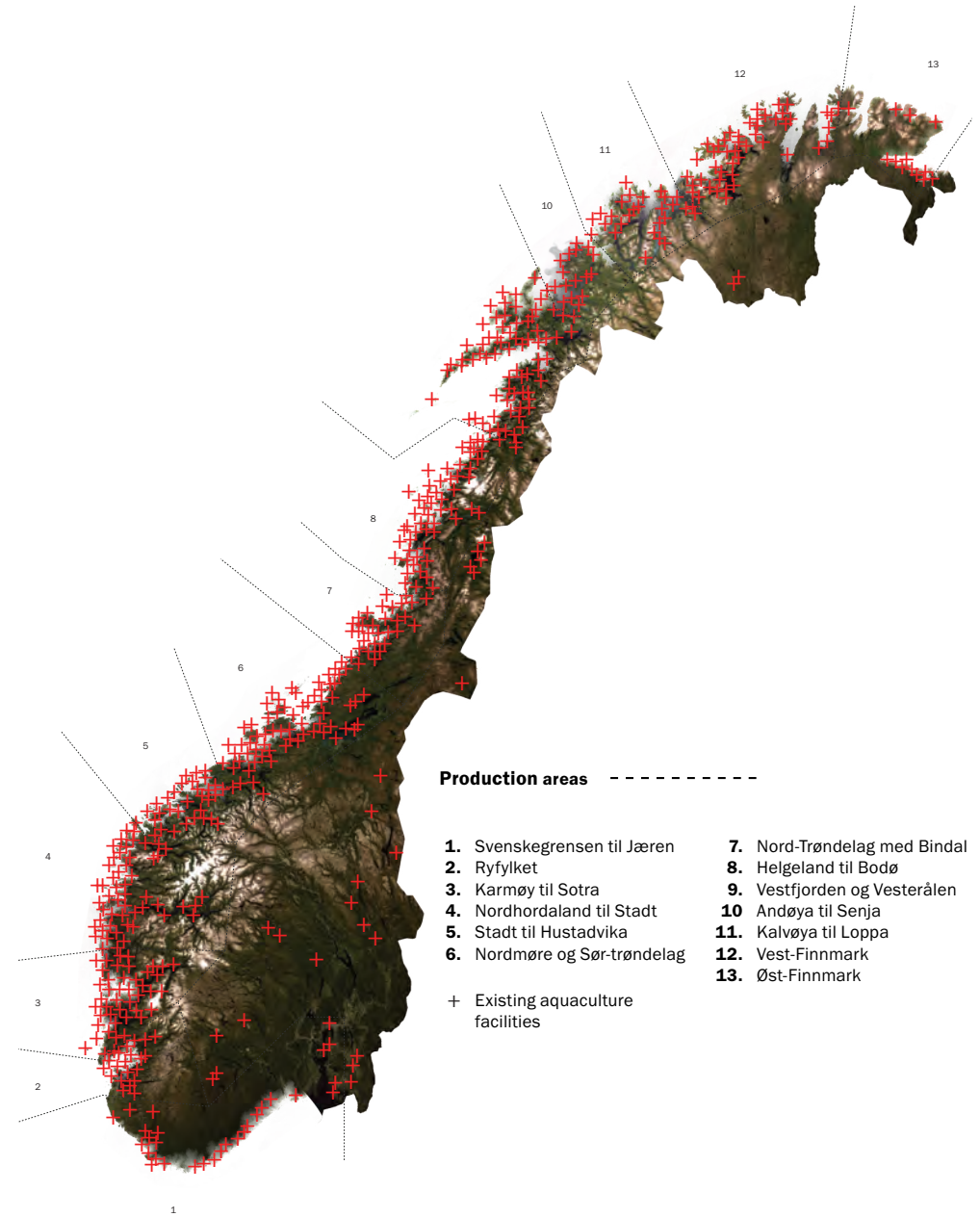
Aquaculture, or fish farming, is an industry that has exploded in Norway since the 70s. Farming fish and shellfish species in tanks and cages along the Norwegian shoreline, the industry has grown to be one of our largest areas of export. The nature of the Norwegian coast, sheltered with its scattered islands and the stable temperatures supplied by the Gulf Stream has provided the foundation for the aquaculture industry to grow into an economical success story, with many seeing potential for the sector to replace the position of oil and gas as main export revenue resource.

With this growth, it is reasonable to expect an increased presence of aquaculture buildings along the coast, especially with the expansion of land based aquaculture. This typology is one of big, box buildings that has been greatly disconnected from their surrounding

context, and often built by companies without roots in the local communities.

If aquaculture is going to be leading Norwegian economics in the future, we need to stop and ask ourselves the questions:  
Who should benefit from this economic growth?  
Where should the ownership lie?  
How much of the profits should benefit the people, and how much should private investors be allowed to pocket?

An aquaculture centre in one of Norway's municipalities with the longest histories of aquaculture could offer neutral ground to discuss and explore the possibilities and challenges with the future of aquaculture.





Aquaculture is of importance not just to Norway and its coast, but to the whole world. If you dine in a restaurant in a Chinese village, and have the choice of ordering local steak or Norwegian farmed fish, imported by plane, the environmental footprint would be smaller for the imported fish, than the steak from the farm down the road. (NRK, 2020) While we know that fish in this regard is a more environmentally friendly part of our diets than red meat, the aquaculture industry is not without environmental challenge.

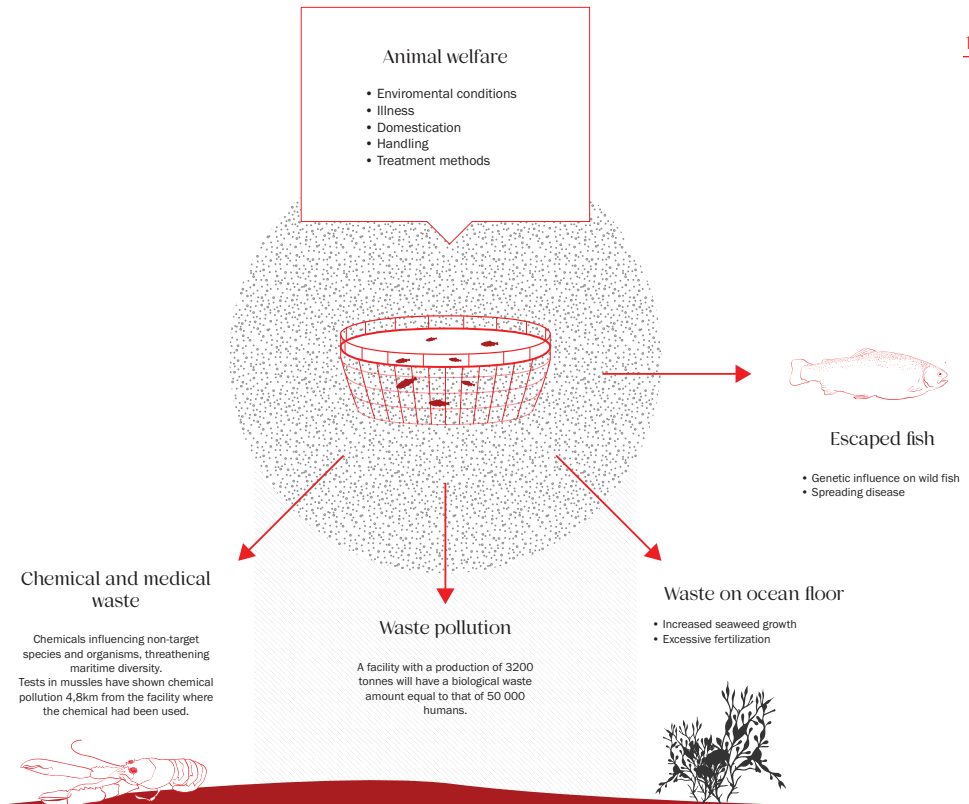
To name some of the most pressing issues within aquaculture, in treatment of farmed fish, chemicals of various sorts are sprayed into the water of the aquaculture pools. These, in open facilities, then spread through the water and affect wild species in proximity to the pools. In water surveys done by the Norwegian Institute for Water Research (NIVA), showed findings of the synthetic pyrethroid Cypermethrin 4,8km from the facilities where the chemical was used. Cypermethrin is used as a neurotoxin, killing salmon louse. As salmon louse is similar to shellfish species such as shrimp and crayfish, and so these species are threatened by the chemical pollution from open aquaculture facilities. When looking at the density of open aquaculture facilities along the Norwegian coast today, we are faced by the sad reality that there are few, if any, places within our waters where these species are safe from neurotoxins not meant for them.

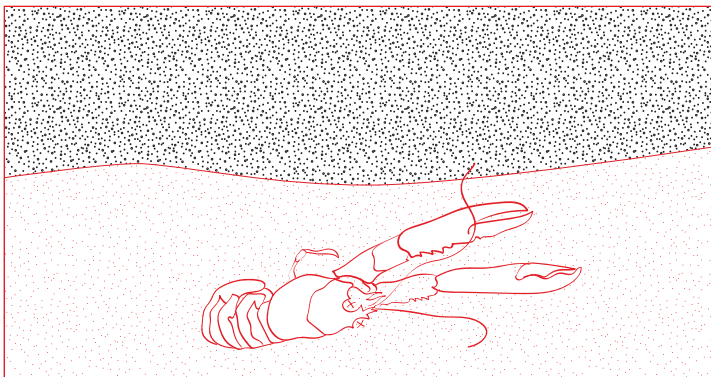
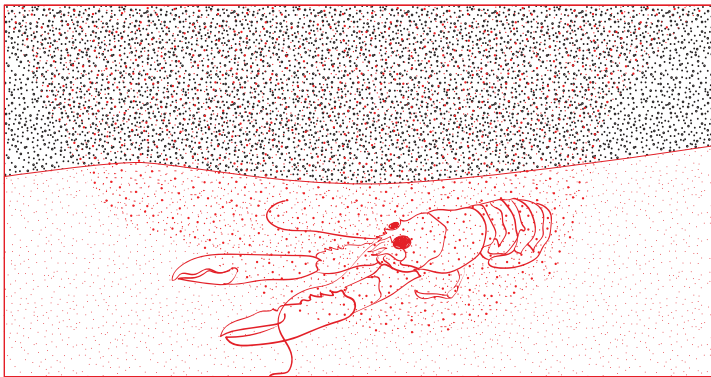
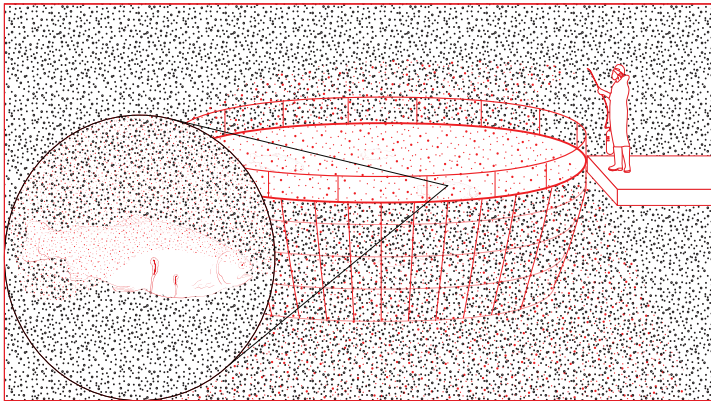
Another issue is escaped fish. When farmed fish escape and mate with wild, they are not just spreading disease originating from within their facility, their

offspring will also be less resistant to changes in their environment than if both its parents were wild fish. Like this, wild salmon populations decrease, and are threatened by extinction. In addition to this, the amount of sewage from aquaculture farms is massive.

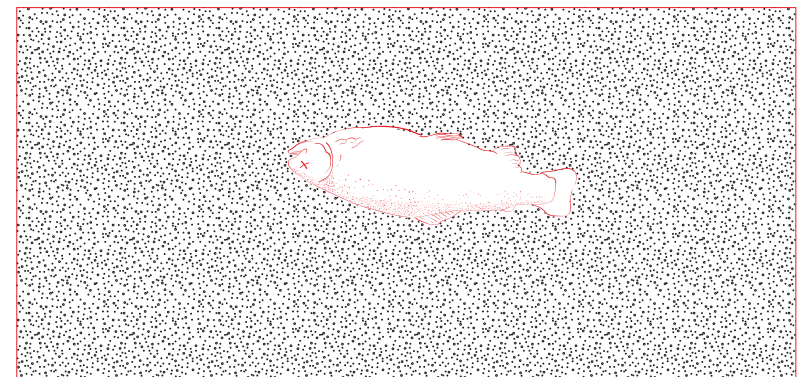
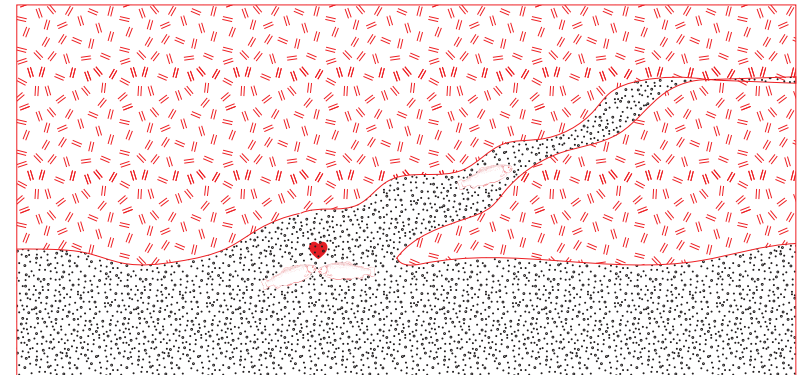
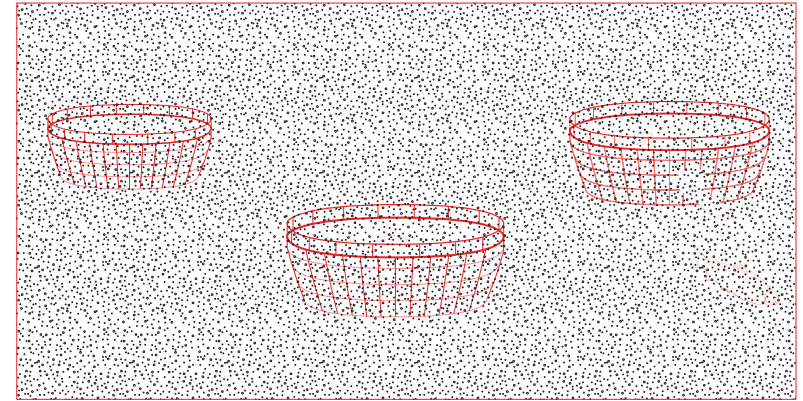
Many point to land based facilities as a solution to these challenges, and in the further development of aquaculture related buildings along the coast, we are faced with questions of architectural and cultural importance:

Can we build buildings that deal with the topic of aquaculture that fit better within the vernacular of the Norwegian coastal village than the box buildings we see today? Can they be more considerate of the human scale? What about their physical footprint on the landscapes they sit within? Can they be flexible in their programme and be used by members of the community?





*The use of chemicals in treatment of salmon louse in open aquaculture facilities is a direct threat to other shellfish species along the Norwegian coast.*



*Escaped fish that mate with wild, get offspring less resistant to changes in their environment and often die as a result.*



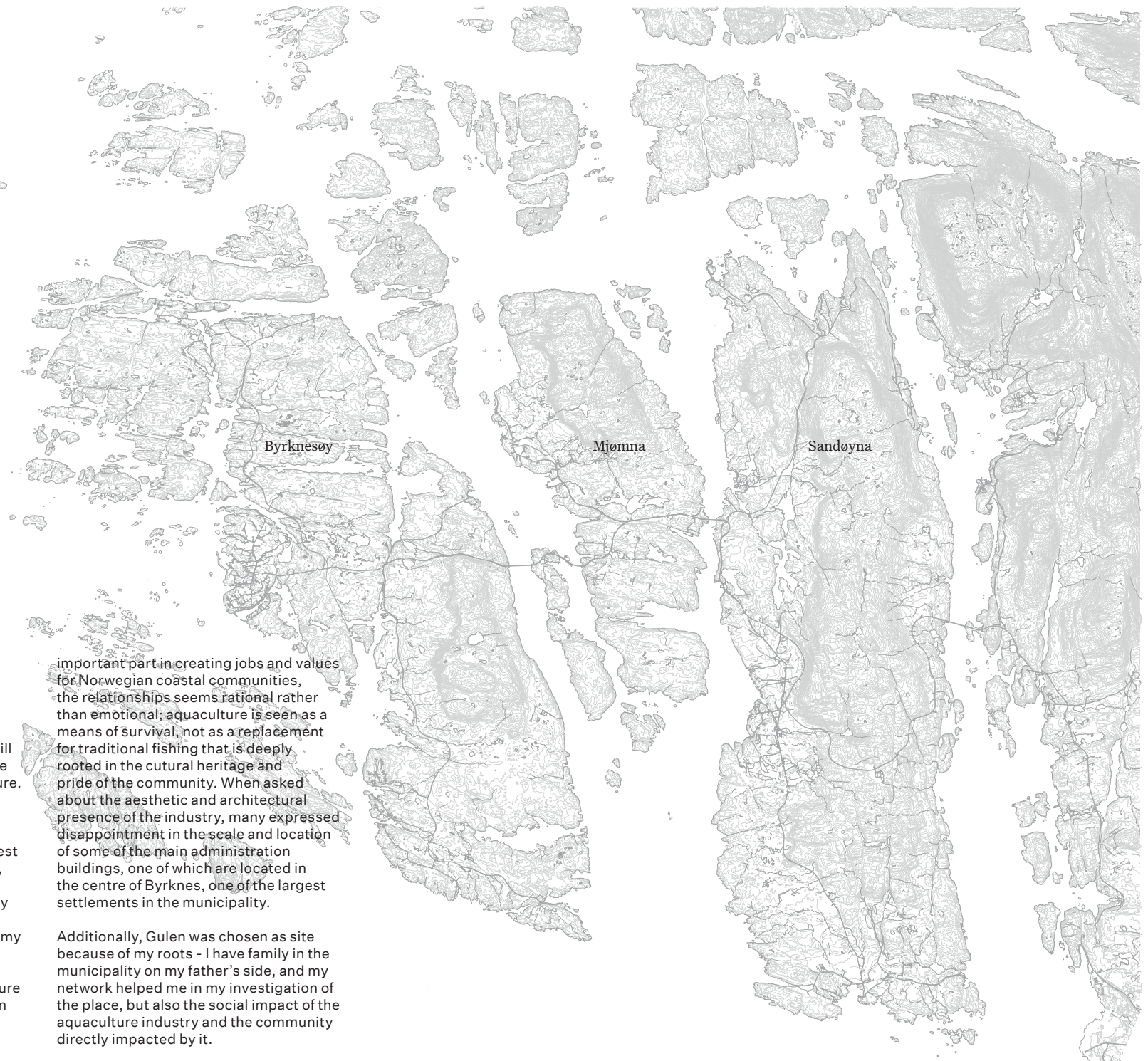
It is important to note that the topic of aquaculture is one relevant to every community along the Norwegian coast. As shown in the map on page 8, aquaculture is a widespread industry and the future growth of the industry will undoubtedly have a big influence on the future of Norwegian coastal architecture.

I have chosen Gulen municipality a few hours north of Bergen because the municipality once was the second largest aquaculture area in the country. Today, the municipality is unique in the sense aquaculture is run almost exclusively by one company, Firdasea, resulting in a large private impact on the local economy and development.

The locals' attitudes towards aquaculture were varied; While aquaculture plays an

important part in creating jobs and values for Norwegian coastal communities, the relationships seems rational rather than emotional; aquaculture is seen as a means of survival, not as a replacement for traditional fishing that is deeply rooted in the cultural heritage and pride of the community. When asked about the aesthetic and architectural presence of the industry, many expressed disappointment in the scale and location of some of the main administration buildings, one of which are located in the centre of Byrknes, one of the largest settlements in the municipality.

Additionally, Gulen was chosen as site because of my roots - I have family in the municipality on my father's side, and my network helped me in my investigation of the place, but also the social impact of the aquaculture industry and the community directly impacted by it.







The buildings relating to aquaculture along our coast today are indisputably of an entirely different scale, materiality and aesthetic than traditional coastal architecture. To investigate this potential for a new architectural coastal typology, I set up interviews with people within the industry and its opposers to try to achieve a nuanced perspective on aquaculture, its challenges and solutions. I also conducted a survey to understand the views of the people of Byrknes, and used the answers of this survey, as well as conversations with the locals, to influence my design process.

For my development of an architectural proposal, I used modelmaking, both physical and digital, drawings and sketches along the whole process. I attempted to keep my investigations

going alongside designing, to insure a dynamic design development.

The final stages of the design process has been greatly driven by landscape on site, and the intention of a minimal physical footprint, as well as the importance of community ownership.







## January

- Primary focus: Social anthropology essay and master course portfolio. Essay topic: Industries and importance for the cultural heritage of smaller communities.

Secondary focus: Mapping site, illustrating aquaculture statistics and facts locally, nationally and globally. Key words: Heritage, future, economy, legacy, sustainable industry.

## February

- Primary focus: Diploma programme development and on-site work. Speaking to locals and industry professionals. Visiting aquaculture facility.

Exploring programme possibilities and deciding programme by the end of the month. 3D modelling and sketch exploration of programmes, physical models to narrow down and decide on programme for further investigation.

Site model 1:10000 and 1:500 to show site in relation to greater island fabric/neighbouring islands and their programmes.

## March

- Primary focus: Second diploma presentation. Having decided on programme, in March form and sustainability will be the main focus. Developing form and exploring material pallettes, trying to strive for locally sourced but durable materials.

Explore form and materials in scales 1:500-1:200 to further detail in April.

“Midterm” cleanup at the end of the month. Mapping and organising material so far and making sure process is somewhat clear. Tweaking calendar to include what might be missing into the remaining months.

## April

- Taking design from concept/form/materiality into smaller detail. Developing first set of technical drawings, plans, sections and elevations as well as a 1:1 3D model for problemsolving.

Bigger scale model of crucial building moments, thresholds, meetings etc.

Visit Byrknesøy again to discuss and get feedback to influence plans, sections and models by showing work so far. Gathering any photographic material missing for further exploration. Video?

Start draft for presentation. Realise what is missing. Get feedback from people unfamiliar with the project.

## May

- Focus on models and detail drawings if and where this is needed. (Showing structure and potential custom/unconventional solutions)

### MODELS AND PERSPECTIVES/OTHER VISUALISATIONS

Second presentation draft. Start printing early for ready material, leave time for mistakes and reprinting.

**Aim to have the essential/crucial project proposal and presentation material finished by the end of May, any add-ons should be considered bonus materials.**

## June

- Building exhibition and cleaning school. Any final tweaks in drawings and models.

Practicing presentation. Focus on clear process and high quality final works.

Lockout by the 26th. Exam.



Julie Alvær Teigen  
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## Education

**Bergen Arkitektthøgskole**  
Master of Architecture

**Manchester School of Architecture**  
Ba(Hons) Architecture with First Class  
Honours

**Akademiet Videregående Skole**  
Media and communication studies  
with specialization in graphic design

## Work experience

**White Arkitekter AB**  
Architectural intern

**Enklere Liv AS**  
Shop employee

**Gullstøltunet sykehjem**  
Assistant

## Other experience

**Manchester Student Society of Architects**  
Head of Communications

**Without a Home**  
Chair/Lead of architectural  
student organisation working with  
homelessness in Manchester.

## BAS Master Courses

**Open form/New woord**  
Public BA(th)S, opening the  
architecture school premises to the  
Sandviken neighbourhood by dividing  
school and public programmes  
by separate circulation axis and  
introducing a sea bath with sauna and  
café for public use.



## Moving Through

Room for the blind: Beyond the ocular  
bias of architectural communication.  
Developing drawing technique for  
architectural communication to the  
visually impaired. Using embossing, as  
well as sensory plan drawings to use  
in architectural discussion with people  
who don't benefit from conventional,  
visual architectural tools.



## Complex Context

Bridging gaps, working with different  
age demographics to improve  
streetscapes and public spaces at  
Laksevåg in Bergen.



**Thank  
you!**

