The Seafood Innovation Cluster

Status Report Q1

Norwegian Centres of Expertise
NCE Seafood
Innovation Cluster

Key figures Q1 2018

- 27 Seafood Trainee's in Trondheim focusing on Innovation & Technology
- 13 new Seafood Companies has signed up for Seafood Trainee program in 2018/2019
- 78 750mNOK application to SIVA for new test-facilities in Bergen on RAS/Digitalisation/3 D printing
- 110 students speed-dating with industrypartners in «Strom i Vannglass»
- 3 international mobilityprograms focusing on sustainable aquaculture (Japan, Canada and US)
- 4 Innovation Grants to Cluster partners
- 2500 cages «on line» in AquaCloud, 300 locations
- 100 students will join AquaHACK, a digital workshop in Aquaculture in Bergen MediaCity
- 19 Innovative Companies showcasing on Seafood Innovation Day, North Atlantic Seafood Forum
- 5 EU applications
- New global partnership for new innovative suppliers in Aquaculture, HATCH,
- 29 events

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Increased awareness of Seafood Trainee

Talent Development

27% increase in applicants

65% increase in Seafood Companies

PARTICIPATING COMPANIES:

Cargill, marineharvest, Grieg Seafood, LERØY, NORGES SJØMATRÅD, LINGA LAKS, SINTEF, Sekkingstad, pwc, BREMNES SEASHORE, EDB & REGNSKAPSSERVICE AS, DNB, NORGES SILDESALGSLAG, Erko Seafood, KPMG, cermaq, Coast COAST SEAFOOD, SEAFOOD TRAINEE

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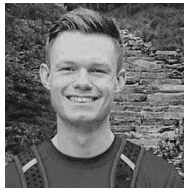
Henrik Lovund
Jurist
Thommessen AS

Jostein Iversen
Sivilingeniør
Grieg Seafood

Gro Vee
Veterinær
MSD Animal Health

John –Felipe Holmgren
Logistikk-koordinator
Cargill

Vegard Tveit
IT
Lerøy



Magnus Holen
Økonomi
Lerøy

Aleksander Sandvik
Planlegging/Logistikk
Lerøy

Sunniva Tangen Haldorsen
Prosjekt
Lerøy

Steffen Lundanes
Økonomi
Lerøy

Thomas Schjøtt Hannevig
Salg/Marked
Lerøy

Heidi Jørgensen
HR
Lerøy

Bettina Wickman Kvamme
HMS
Lerøy

Nicklaes Thomsen
Røkter
Lerøy

Kine Thorsvik
Biomasseoppfølging
Lerøy

Andrina Heldal
HR- koordinator
Marine Harvest

Benedicte Simensen
Kjemi og bioteknologi
Marine Harvest

Lene Torgersen
Celle & Molekylærbiologi
Marine Harvest

Jan Aleksander Enoksen
Master 2013
Sjømatrådet

Christopher Vonheim
Bachelor 2015
Sjømatrådet

Solrun Liljedal
Bachelor 2015
Sjømatrådet

Rina Riddervold
Master 2017
Sjømatrådet

Jonas Sittampalam
Master 2017
Sjømatrådet

Marie Skjeldås
Master 2017
Sjømatrådet

Cathinka Haagensen
HMS
Lerøy

Mia Bernhardsen
Master 2016
Sjømatrådet

Helene Aarland Holm
Intern Lerøy

Seafood Trainee 2017/2018

SEAFOOD TRAINEE

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Seafood Trainee Module 2 – Trondheim 17-19 jan

- Innovation & Technology

Talent Development

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Seafood Trainee - Open Info Day 23.jan

Talent Development

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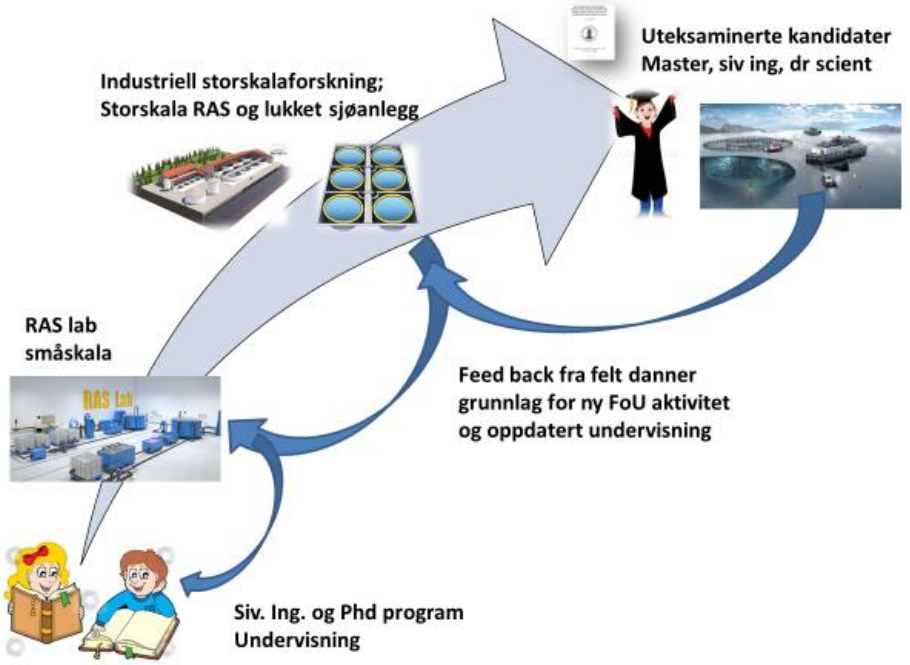
Increased capacity for sustainable and innovative seafood production – Kapasitetsløftet for bærekraftig sjømatproduksjn “KABIS”

Talent Development

- KABIS aims to contribute to new education programs, new knowledge and more innovation in closed production technology for the aquaculture industry. The aim is to achieve further sustainability and cost efficient production of salmonids. The project is managed by Uni Research, now NORCE.

- KABIS is built on the Cluster’s sponsorship of an Industry-professor (3mNOK). The Cluster’s contribution has been fundamental for the success of receiving 55mNOK from the Research Council. This funding enables our Cluster to increase our capacity in developing new educational programs and foster more joint- innovation projects between industry-R & D.

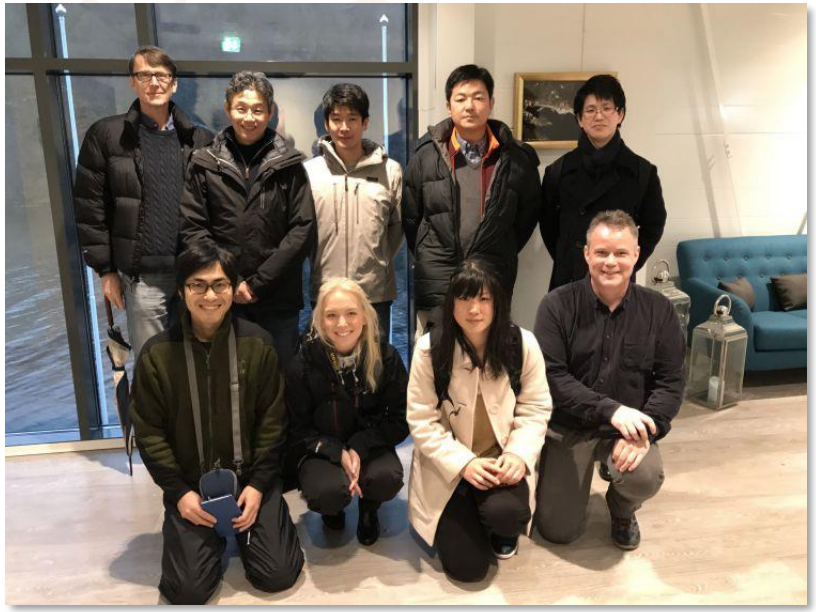


International Mobility programs

Talent Development

International Partnerships for Excellent Education, Research and Innovation:

- Excel Aqua, Sustainable Aquaculture: Partnership between Norway and Japan
- Cross Atlantic Sea Lice: Partnership between Norway and Canada
- Aquaculture Biology: Partnership between Norway and North America



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Innovation grants for Cluster collaboration

Sustainable Innovation

A call by Innovation Norway, the Innovation Framework Grant is a small scale grant applicable for clusters only. Being a small grant, upwards of 1 million NOK, the grant is used as a risk reducing mean for small and medium sized companies for bringing forward novel ideas and concepts that need further developing before becoming a fully-fledged project in their own right. The Cluster has initiated 4 projects in Q4-2017:

Decision support for better management of biological risk in farming	Historical and geographical distribution of Tenacibaculum maritimum	Sharing of environmental data in the aquaculture industry	The eff ect of mechanical delousing on the thymoid tissue in salmon
Optimeeringaqua	PHARMAQ	Seasmart	PHARMAQ
Grieg Seafood		Anteo	

Supported by: Innovasjon Norge

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Ocean Innovation Catapult - OIC

Investment plan of 78 750mNOK to develop new infrastructure in Marineholmen for testing and piloting of:

- 3 D printing of new materials
- RAS
- Digitalisation/Big Data
- Training programs

Application sent to SIVA 22th of March.

Joint Innovation Initiative on the new traffic light system in Production ZONE 3

Supplier Development

Together with the municipalities of Sund/Fjell/Øygarden the Cluster has taken a joint innovation initiative for a "Road map" on innovation measures to be taken to get from red to green in Production ZONE 3. The initiatives engages local aquaculture companies, local governmental authorities, R&D community and national governmental authorities.

The aim is to explore new methods and technology that will reduce the environmental impact to achieve green status. The aim being to develop the industry in a positive way and secure viable growth in the region.

uni Research

Gode sirklar
KOMPETANSEDRIVEN NÆRINGSUTVIKLING

Global Centres of Expertise
GCE Subsea

HORDALAND FYLKESKOMMUNE

Norwegian Centres of Expertise
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CO2Food progress report

Sustainable Innovation

- Together with the CO2Bio AS and the new Algae pilot facility from the University of Bergen, NCE Seafood Innovation Cluster has supported 5nMOK to develop a solid knowledge and innovation platform on local production methods of micro algae. Our ambition is to develop and apply knowledge that can boost innovation of new functional, cost-effective and sustainable raw materials in salmon feed.
- CO2FOOD has selected 7 strains as possible interesting candidates for aquafeed, following the industrial requirements on nutritional profile. Focus has been on **optimization of cultivation conditions.**
- Further innovation focus to upscale **pilot production of biomass and further processing.**

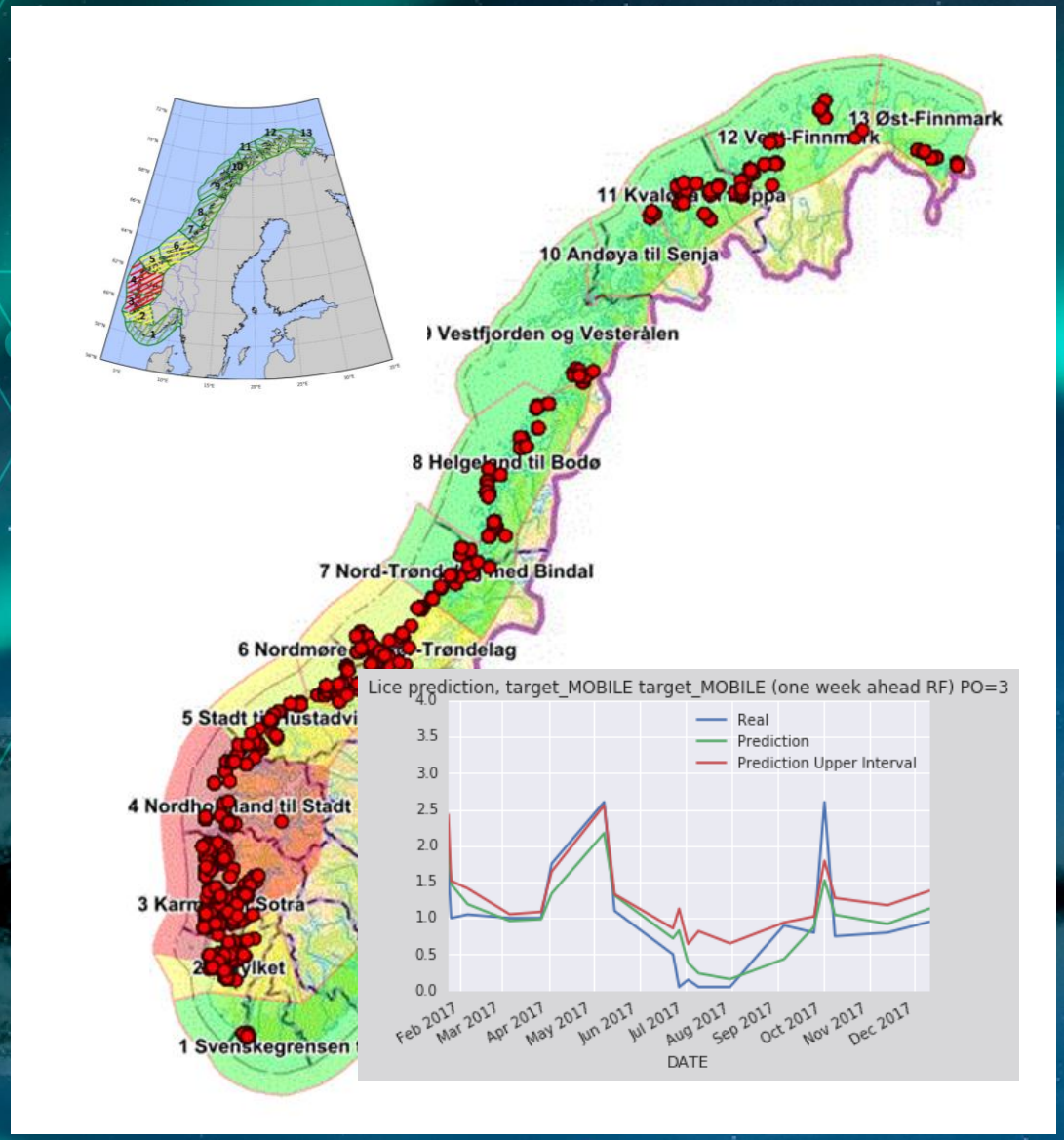
CO2BIO

Innovasjon Norge

Norwegian Centres of Expertise NCE Seafood Innovation Cluster

AquaCloud 2.0. Goals for Q1 2018

- Step #1 : From 240 to 2250 cages
- Step #2 : Production zone modelling
- Step #3 : New datasets – resistency and coastal currents
- Step #4 : Deep analysis of environmental factors



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NORTH ATLANTIC SEAFOOD FORUM
THE WORLD'S LARGEST SEAFOOD BUSINESS CONFERENCE
MARCH 6–8 2018, BERGEN, NORWAY
Norwegian Centres of Expertise
NCE Seafood
Innovation Cluster
SEAFOOD INNOVATION DAY
INNOVATION STORIES AND INVESTMENT OPPORTUNITIES
MARCH 8 2018, BERGEN, NORWAY
SEAFOOD INNOVATION AWARD
INNOVATIONS FOR SUSTAINABLE SEAFOOD GROWTH
MARCH 8 2018, BERGEN, NORWAY

Innovation Award for fighting bacteria in aquaculture

In competition with 18 companies at Seafood Innovation Day NASF 2018, the seafood industry's own innovation award went to Scottish Innovation Company Fixed Phage, which develops products that can fight specific bacterial strains.

For the first time, the seafood industry´s innovation award was awarded on Seafood Innovation Day at the world's largest seafood conference, North Atlantic Seafood Forum, in Bergen, March 8th. The seafood industry itself has taken the initiative for the new prize aimed at stimulating and recognizing knowledge-based innovation and entrepreneurship.

The conclusion of the jury:

The Award Committee evaluated the companies and selected the winner based on the following criteria: Innovation, Market Potential and Sustainability. The winner has developed an innovative product that addresses many of the major challenges of contemporary seafood production, like food safety, fighting antibiotic resistance and feed efficiency.The market potential is huge, and the winner has a product that is easily scalable and has also an operational plan for market penetration and commercialization in near future.The winner is addressing challenges that we are facing for developing of a sustainable seafood industry, and the product itself is environmental friendly.

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Showcasing 19 start-ups Innovation Award

Finless Foods

MicroSynbiotix Ltd., Ireland, is developing a novel, patent-pending method of producing oral vaccines using transgenic microalgae. The solution will make disease management much more sustainable and reduce the need for antibiotics.

Quantidoc AS, Norway, creates value for customers by providing objective and comparable data that links immunity with diet, environment, and treatments/handling.

KnipBio Inc., USA, has developed a set of naturally occurring microbe strains that convert ethanol, methanol and other abundant, low-cost feedstocks into premium, nutritious, single-cell protein.

EIR of Norway AS, Norway, is developing sea cucumbers for the Asian market. Sea cucumbers are a popular food item in the Asian market and the company is passionately working to delivering the very best the arctic waters have to offer.

H2O Technics B.V., The Netherlands, is a family business engaged in the distribution and maintenance of H2O Nano cavitation systems. These systems eliminate harmful organisms, parasites, algae, and biofouling.

Optimeering Aqua AS, Norway, brings to market advanced optimization tools for production and market operations in the salmon and aquaculture industry.

Invertapro	Invertapro AS, Norway, produces high-quality protein and plant nutrition based on the Tenebrio molitor larvae (Mealworm) and Hermetia illucens larvae (Black soldier fly) using waste-streams as resources to create a truly circular economy.
MITHAL AS	MITHAL AS, Norway, has developed REMORA, an automated net cleaner that also maps the integrity of the net. REMORA is the maritime variant of the robot mower providing better growth conditions and uninterrupted feeding.
estro	Estro AS, Norway, offers unique competency and wide knowledge, creating an innovative and complete partner for your company.
BLUE LICE	Blue Lice AS, Norway, wants to switch focus from treatment to prevention. Their patent pending system prevents sea lice before it affects the fish reducing the need for treatments. Their solution increases welfare in a sustainable and effective way increasing quality and production rate.
WHITE DOG LABS	White Dog Labs Inc., USA, is a biotechnology company founded upon synthetic biology and bio-process development. Using their proprietary technologies, they are developing market solutions for global challenges by harnessing the natural advantages of microorganisms called Clostridia.

AQUA-PRO	AquaPro AS, Norway, has a vision of solving an environmental challenge, by offering sustainable waste management and further develop the technology to process other types of biological waste for valuable plant crops and / or energy.
Fishency	Fishency AS, Norway, is all about access to good and extensive data. Automated sea lice counting system will provide a solid decision support for sea lice treatments in the fish farming industry. Good data can optimize treatments and reduce the environmental impact of aquaculture.
Finless Foods	Finless Foods Inc., USA, is an early-stage biotechnology company whose mission is to develop and mass manufacture pioneering marine animal food products for human consumption.
DryGro™	DryGro Ltd., UK, is an agriculture technology company that has developed new ways to grow animal feed ingredients on arid, unproductive land.
MANOLIN	Manolin Inc., USA, designs systems that simplify the management og aquaculture operations. From coordinating operations and management to inventory management, workflow tracking, health monitoring to predictive analysis.
FJORD MARITIME	Fjord Maritime offer cost-effective services and products. Our complementary background and over 40 years of speed in the aquaculture industry gives us the ability to quickly get into the customer's situation.

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Positioning for world's biggest innovation programme - aquaculture key for EU's food policy

Sustainable Innovation

Norwegian ocean clusters' position on EU funds in investment, research & innovation, SMEs and single market

Mission Oceans

Creating Sustainable Ocean industries and Markets by 2030

The Norwegian Ocean Clusters, GCE Subsea, GCE NODE, GCE Blue Maritime, NCE Seafood and Blue Legasea **recommend a Mission Oceans to create European industrial leaders and markets through sustainable exploitation of the oceans.**

On 6 December 2017, the United Nations officially designated the years 2021 to 2030 as the 'Decade of Ocean Science for Sustainable Development'. This is a huge opportunity for Europe to show leadership to address the Sustainable Development Goals (SDGs). SDG14, Life below water, recognises the role of the ocean as the enabler of all 16 SDGs and the basis for sustainable growth. This implies that sustainable development and societal impact is dependent on sustainable exploitation of ocean resources.

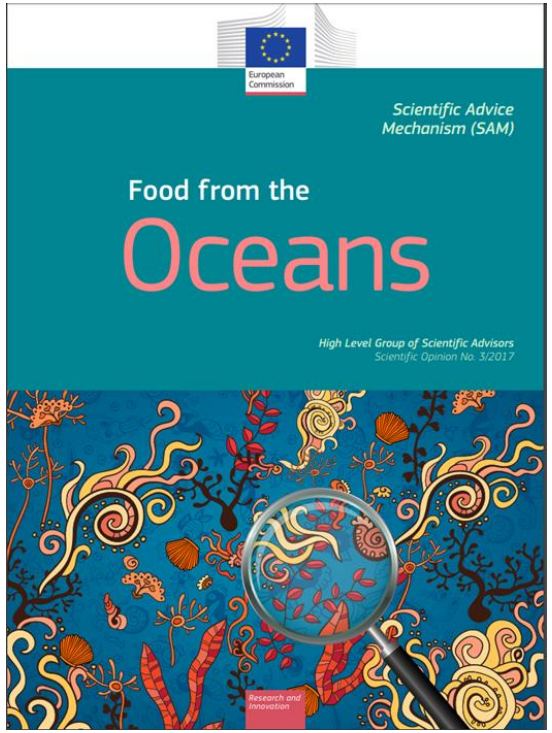
This in turn requires a paradigm shift in the way we understand ocean systems. Building on excellent ocean science we need to start imagining the ocean as a farm and not only as a conservation area. European Seas and Oceans should be the worlds' living lab for biotech, sustainable food and energy production. The ocean industries stand ready to take this quantum leap on a scale that is needed to understand, protect, manage and sustainably exploit our Ocean and natural environment for the benefit of society.

We propose to break down Mission Oceans into three main "moonshot" missions:

1. *Smart Ocean is the global standard of ocean operations and monitoring by 2030*
2. *The ocean is providing 30% of sustainable energy by 2030*
3. *The ocean is providing 10% of sustainable food and feed by 2030*

1. Smart Ocean is the global standard of ocean operations and monitoring by 2030

Robust support is needed to make Smart Ocean the global standard of ocean operations and monitoring by 2030. The ability to effectively manage environmental and biological risk as well as to run safe and sustainable operations in the ocean will be vital for extending our license to operate. The European ocean industries are world leaders in safe and sustainable ocean operations. To keep this position, we need to exploit the opportunities offered by digital technologies to ensure that future operations and maintenance strategies as well as monitoring and predictive capacities will also allow us to uphold our zero-harm standard and further achieve SDGs 3, 7, 9, 12, 13, 14 and 17.



European Aquaculture Technology and Innovation Platform

eurastip

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EU Projects in Q1 2018

Sustainable Innovation

Project	Innovation topic	TSIC partners	EU grant
iFISHiency	Biology Online Steering System (iBOSS) / smart feeding, fish welfare, quicker response time. iFishIENCi will target circular principles and zero waste by qualifying new and sustainable organic value chains for feeds, and valorisation of by-products.	Cargill, uniResearch, NCE Seafood Innovation Cluster	€ 6 million
PLASMA4FRESHFOOD	Cold plasma technology increasing duration of fish and green salad freshness. The project will provide the necessary data for the establishment of cold plasma processing as a new preservation method and to develop protocols for the optimal cold plasma process design for sustainable production of safer fresh products of superior quality and extended shelf-life, in line with the demands of consumers, SMEs and EU policies/regulations.	BREMNES SEASHORE, NCE Seafood Innovation Cluster	€ 7 million
Smart Ocean	New value chains - merging Information and Communication Technologies with aquaculture and renewables production. The project will support joint innovation projects between SMEs of four clusters: NCE Seafood (Norway), GCE Subsea (Norway), Cyberforum (Germany) and the Blue Supercluster (Belgium).	NCE Seafood Innovation Cluster	€ 5 million
WSENSE	IoUT – underwater communication	LERØY	tbc
Fishfacts	Training of aquaculture specialists	NCE Seafood Innovation Cluster	tbc

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EU up-coming Cluster opportunities Q2 2018 – Q1 2019

Sustainable Innovation

Project	Innovation topic	TSIC Partners	EU Grant
Mission Oceans	1) Increasing the overall innovation budget of the EU's R&D and Innovation programme 2) Positioning aquaculture as key to the EU's food policy (market pull for food from the oceans) 3) Aquaculture as the first carbon-negative industry	tbc	€ 5 billion from 2020- 2027 (desired)
Multi-use of marine space	The pilots shall aim to demonstrate in a real environment the viability (economic, social and environmental) of the multi-uses of a marine space for the output of at least two economic activities (such as renewable energy, aquaculture, marine bio-resources and biotechnologies, maritime activities and related services or tourism).	tbc	€ 9 million
Alternative proteins for food and feed	Proposals shall identify and assess new or alternative protein sources for food and/or feed and develop/validate efficient production and processing approaches to convert/integrate them into high quality, safe, healthy, and sustainable products or ingredients.	tbc	€ 8 million
The Future of Seas and Oceans flagship	The action shall contribute to the development and demonstration of the feasibility of the European component of a future Global Ocean Observing System - intenrational collaboration in oceanography	tbc	€ 12 million
All-Atlantic Research Flagship	New value chains for aquaculture production. Activities shall explore new species, products and/or processes for aquaculture production (including algae). Capacity building and networking along and across the Atlantic Ocean (South Africa and Brazil + other Atlantic Ocean coastal states	tbc	€ 8 million

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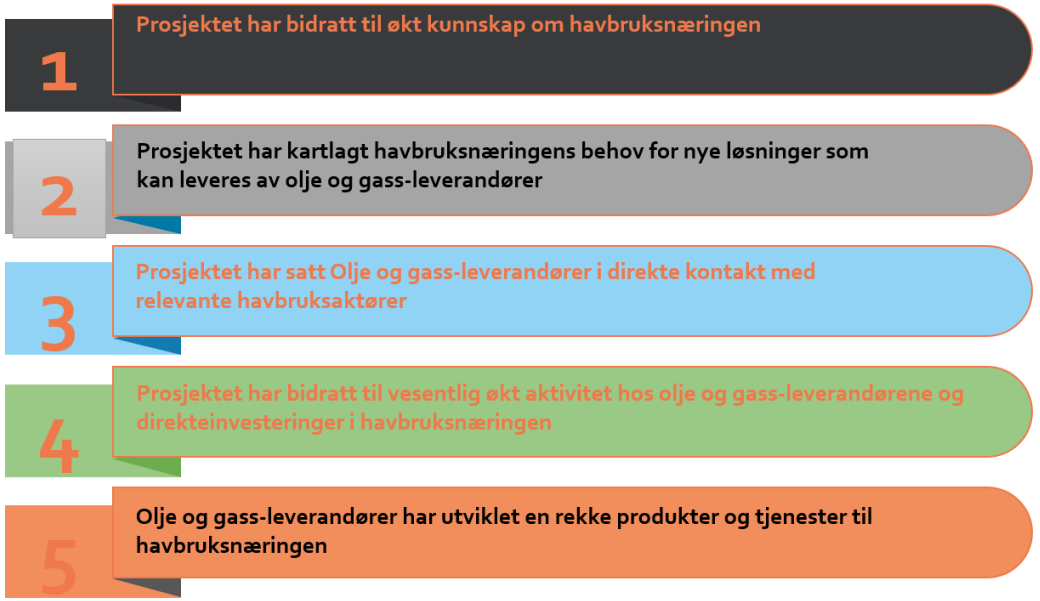
Crossover - New suppliers from oil and gas into aquaculture

Supplier Development

- Through multiple Cluster to Cluster events and meetings, the subsea industry has connected with the aquaculture industry.
- In a short period of time several suppliers to the oil and gas industry have found new markets for existing products and new partners for cooperative development of new and existing product lines. The program has seen products such as camera systems, digital image enhancing and advanced sensorics finding new markets and applications within the aquaculture industry



HORDALAND FYLKESKOMMUNE

Global Centres of Expertise GCE Subsea

Deloitte.

Kontali

Norwegian Centres of Expertise NCE Seafood Innovation Cluster

Partnership with new global New Global Aquaculture Accelerator

Supplier Development

- HATCH is the world´s first start-up accelerator focused on the aquaculture industry, beginning April 2018 in Bergen, Norway. HATCH is formed as a joint initiative with the Cluster's local partner Bergen Teknologioverforing (BTO), which will host the program on Marineholmen campus.

  Hatch will select eight of the world´s highest-potential aquaculture start-ups to be accelerated. Each startup team will receive a cash investment of €25,000 but the real value of the program will entail mentoring, coaching and access together with the Cluster's network.

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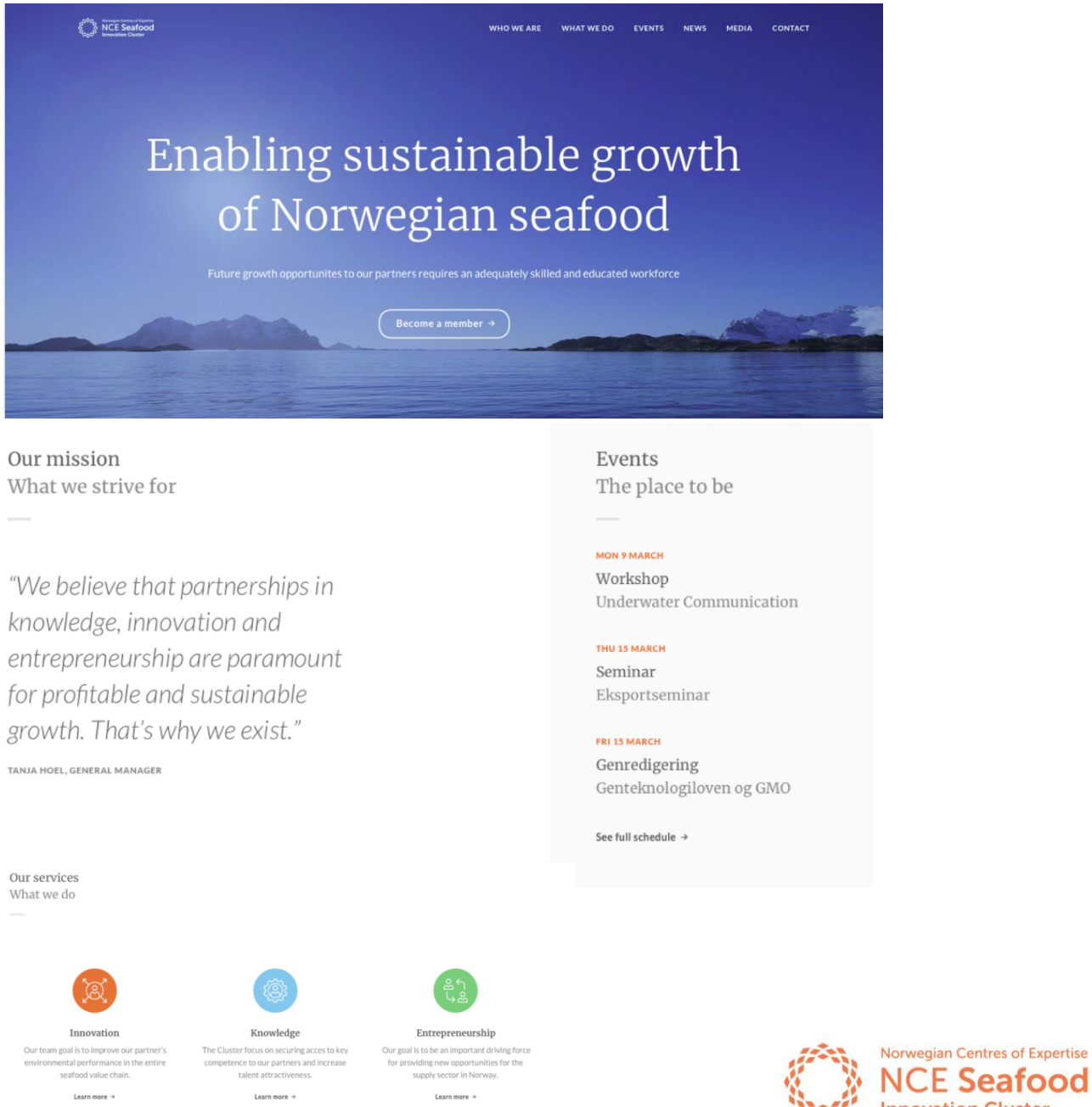
New website

- We want to update our profile to a cutting-edge standard, to show that we are on top of innovation

- Design and development of the content will be optimized to shine a light on the role of The Seafood Innovation Cluster in the ecosystem.



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Events and Meetings Q1 2018

January	HATCH Info Day Seafood Trainee Info Day Seafood Trainee, Module 2 Presentation Innovation City Bergen, NHH Presentation Artic Frontiers Stand, Aqkva HAVlunsj, Grønn teknologi i havbruk Partnermeeting
February	Presentation PwC Presentation EY Presentation Young Fish Presentation Direktorate of Fisheries Strategimeeting, Innovation Norway Workshop, Søknad Katapult Seafood ACCEL, Demo Day with Investors Opening of Veterninary Institute in Marineholmen Worskhop, Ocean Cluster Collaboration
Mars	Meeting with Minister of Foreign Affairs, S E Asia North Atlantic Seafood Forum Presentation IBM new visitor centre Presentation Rederiforeningen HAVlunsj, Maskinlæring og kunstig intelligens i havbruk Presentasjon Bioteknologirådet Presentasjon, Møteplass Marin, Bergen Næringsråd Presentasjon, DNB Workshop, Undervannskommunikasjon Workshop, Fra Rødt til Grønt i P S 3 Workshop, Søknad Katapult Workshop, EU Ocean Flaggship Initiative

Photo: Meeting with State Secretary Roy Angelvik, presentation of AquaCloud, 6th of March

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Upcomming events Q2

9. April, Strom i Vannglass
19. April, HAVlunsj
22.-26. April, Seafood Trainee Seafood EXPO
24. April, IBM Workshop
7.-8. May, AquaHACK
22.-26. May HATCH Customer Week
24. Mai, HAVlunsj
1. June Styremøte
7. June, Partnermeeting
6.-8. June, Seafood Trainee, Tromsø

Full event kalender: seafoodinnovation.no

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Aquahack 2018

the first aquaculture technology hackaton

- NCE Media City lab may 7-8th
- Over 50’000 NOK in prizes
- 60 attendees & 3-5 people in each team
- 40 Hours of development of MVP
- Expert industrial & Technical judges

Attendees: Anyone can attend!
Programmers, biologists, marketers, scientists, astronauts, farmers etc.

For mer info

facebook.com/AquaHackBergen

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Thank YOU!

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R&D Partners:

Members:

Contributers:

Financial partners: