



Norwegian Centres of Expertise
NCE Seafood
Innovation Cluster

Annual Report 2019





ANNUAL REPORT 2019

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Working together for sustainable seafood growth

In 2020 NCE Seafood Innovation Cluster enters its fifth year as a Cluster. Together with our partners and members we have established a foundation of trust and collaboration that enables us to collectively attack challenges and explore new possibilities in the seafood industry.

Based on our belief that industrial collaboration is the way forward, our joint effort in building a Cluster has resulted in sustainable innovation projects where we facilitate interaction across the industry with great success.

Adopting to new strategy

Our new strategy, launched in January 2019, has been implemented during this year. The rationale behind the strategy, to the benefit of our owners, partners, members, and stakeholders, is to boost innovation and sustainable seafood growth. The strategy states that the way forward for the Cluster was to implement a third strategic business area, *Entrepreneurship & Commercialization*, as well as adopting

to the “five-point stakeholder model”. The foundation of our new strategy is to build a strong innovation ecosystem, aiming to boost sustainable seafood growth by focusing on key drivers of innovation such as competence, innovation, and entrepreneurship. To reach these goals, we focus on strengthening the interaction with entrepreneurs and risk capital in order to support new solutions and knowledge sharing to increase our members’ competitiveness in the global market.

Strong project activity

In 2019 we have hosted or co-hosted around 50 events with more than 1800 participants, in addition to participating at more than 70 national

and international meeting arenas. We aim to foster collaboration, share knowledge, and join forces to resolve industry challenges as well as boosting entrepreneurship and attracting capital to the seafood industry.

This has resulted in establishment of several seafood industry projects in 2019 and NOK 63 m in funding for new projects together with our Clusters partners and members, this year. During 2019 we have been involved in 18 seafood projects, that we believe will contribute to boost innovation and create value for our cluster members and in the seafood industry.

Main Achievements

When summarizing the year, I wish to highlight some of our projects and mention our greatest successes in 2019.

- The AquaCloud project has been developed significantly during the year. In 2019 we focused on improving the foundation of data



through standardization. The AquaCloud database is constantly expanding with data, with weekly data from about 1100 fish cages across the norwegian coast, while we focus on improving the quality of data within standardization of: 1) fish health and welfare data, 2) environment data, and 3) sensor data.

- This year 30 seafood trainees completed their trainee period in June, while 33 new trainees started in August. The competence program has attracted great interest, and we are planning to expand with a new program in 2020.
- The Seafood Executive Forum was carried out with great success. Top leaders from our strategic partners meet in a closed forum to be inspired, gain new knowledge, and influence the Clusters' way forward.
- Two new incentives related to our strategic focus on entrepreneurship and commercialization; "Upcoming

Seafood Start-ups" and "How to raise capital?". Both initiatives benefitted our cluster start-ups greatly in terms of valuable new competence, networks, and the possibility to strengthen the companies' capital.

Entering 2020 and the fifth year for NCE Seafood Innovation Cluster, we are highly motivated to add value and work closely with our partners and members to contribute to sustainable growth in the seafood industry. Together with our Cluster partners and members we will expand our knowledge, boost innovation, and further develop the ecosystem for entrepreneurship in the seafood industry.



Nina Stangeland

MANAGING DIRECTOR

ABOUT US

A collective effort for sustainable seafood growth

NCE Seafood Innovation aims to contribute to sustainable seafood growth, by focusing on innovation.

Based on our belief that industrial collaboration is the way forward, our cluster establishes sustainable innovation projects and facilitates interaction across the industry. We

strive to foster collaboration, share knowledge, and join forces concerning industry challenges, as well as boosting entrepreneurship and attracting capital to the seafood industry.

As a member you benefit from access to a wide range of services and activities related to our key strategic business areas: competence, innovation, and entrepreneurship. Simultaneously you are contributing to innovative and

sustainable solutions for further growth within the seafood industry.

It is imperative we fulfil the UN's sustainability goals. Consequently, we put every effort into facilitating global partnerships and properly preserving and utilizing our oceans and marine resources.

Our business areas:

NCE Seafood Innovation Cluster focuses on three strategic business areas; Knowledge, Innovation and Entrepreneurship. We believe, that these are three areas that are closely correlated and highly integrated. Together with our partners and members the Cluster wants to contribute, develop and facilitate strong interaction within these areas – and build a strong ecosystem and foundation for sustainable growth in the seafood industry.



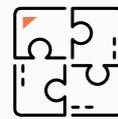
KNOWLEDGE

By focusing on knowledge sharing and building competence across the value chain, and define future need for competence in the industry, the Cluster contributes to new industry education programs, facilitates competence programs and attracts new talents to the industry.



INNOVATION

In order to solve challenges and explore new business in the seafood industry, the Cluster facilitates interaction and initiates innovation projects between research, industry and entrepreneurs in the whole value chain of the seafood industry, national and globally.



ENTREPRENEURSHIP

Building an ecosystem for entrepreneurs by connecting the industry, capital and competence is key factors for boosting entrepreneurship in the seafood industry, the Cluster connects, shares competence and contributes to stronger interaction between entrepreneurs, industry and capital providers.

NCE SEAFOOD INNOVATION

Cluster management

**Nina Stangeland**

MANAGING DIRECTOR

nina@seafoodinnovation.no

Nina Stangeland has experience within finance and corporate analyses, business development, strategy, marketing and entrepreneurship from different industries. She is educated Master of Economics from University of Oslo. Nina has the overall responsibility for the Clusters management, activities and projects, and is reporting to the board of the The Seafood Innovation Cluster.

**Benedicte Skogen**

COMPETENCE MANAGER

benedicte@seafoodinnovation.no

Benedicte Skogen has experience within strategy, business development, concept development, brandbuilding and project management in the food industry. She is educated Master of Economics from University of Kristiansand. In the Cluster she is responsible for Seafood Trainee and projects related to talent development.

**Björgólfur Hávarðsson**

INNOVATION MANAGER

bjorgolfur@seafoodinnovation.no

Björgólfur Hávarðsson has experience with site and production management with focus on feeding and feeding behaviour, smolt quality and transfer strategies, quality management, fouling organisms and antifouling. He holds a MSc in aquaculture biology from the University of Bergen. Björgólfur is responsible for the clusters focus on innovation and facilitates industry projects, knowledge sharing, mentorship and matchmaking.

**Solveig Holm**

SENIOR ADVISOR

solveig@seafoodinnovation.no

Solveig Holm has experience with project management, strategy, business development and internalization from different positions in private and public sectors. She is educated Cand.polit. in Social Anthropology from the University of Bergen. Solveig has the last year been engaged in The Seafood Innovation Cluster working with cluster projects and events.

**Patricia Apablaza**

PROJECT CONSULTANT

patricia@seafoodinnovation.no

Patricia Apablaza is a veterinarian with a PhD in fish health from the University of Bergen. She has experience as a researcher in aquaculture with emphasis on fish diseases. In the Cluster she has been involved in the development of different seafood projects i.e prevention of transmissible diseases in salmonids. In addition she has contributed to project management and cluster administration.

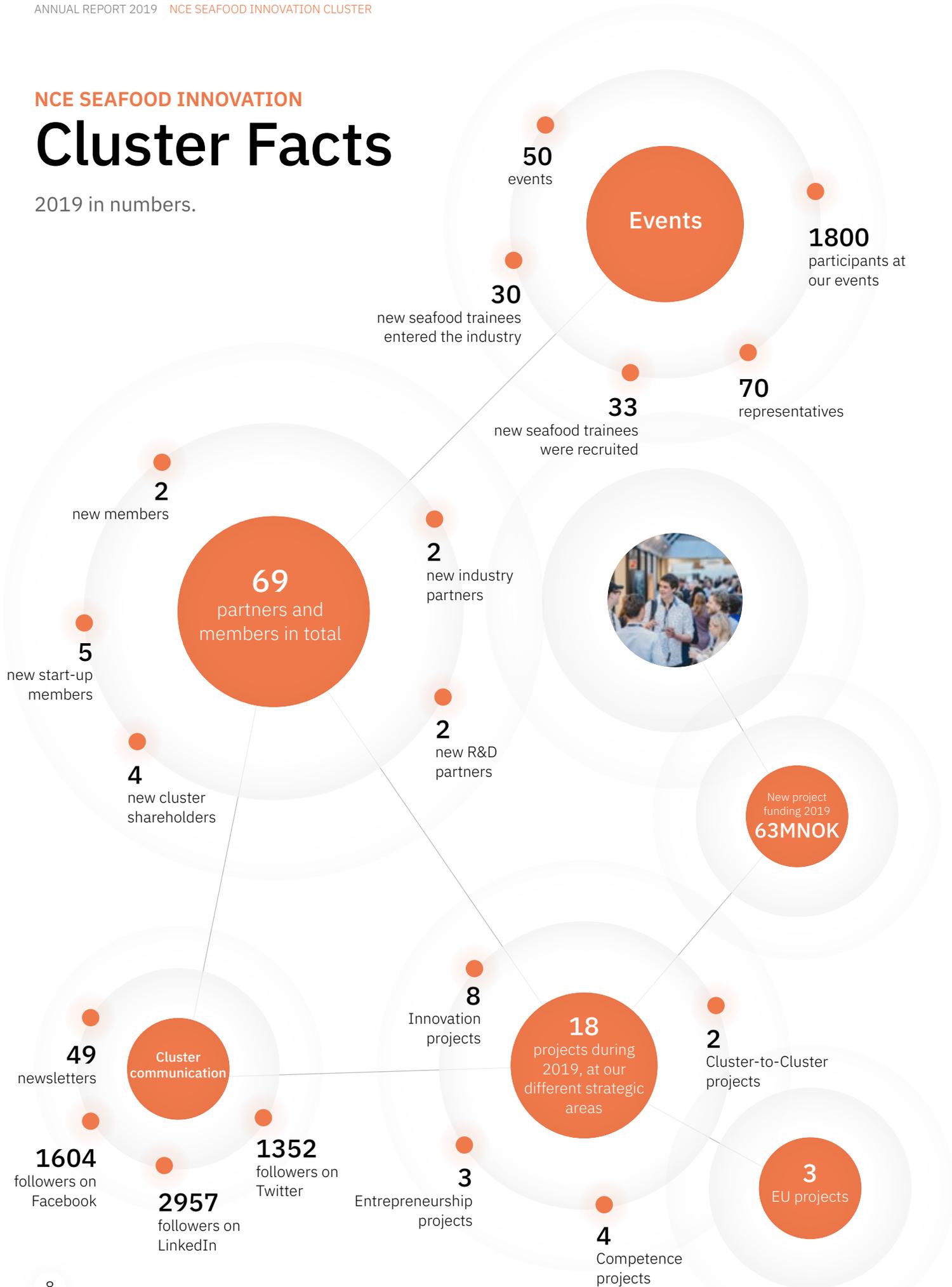


In 2020, we welcome **Pia B. Singdahlsen Rønningen** as new Business Developer within our strategic area of Entrepreneurship. **Carl H. B. Haukås** is employed for a period in 2020 as a project consultant, to develop the seafood innovation portal.

NCE SEAFOOD INNOVATION

Cluster Facts

2019 in numbers.



SUSTAINABILITY:

We aim to fulfil the UN’s sustainability goals

Consequently, we put every effort into facilitating global partnerships and properly preserving and utilizing our oceans and marine resources. Particularly relevant to the Cluster’s work are the following *Sustainable Development Goals*:



SDG 12

Ensure sustainable consumption and production patterns.

In compliance with our overall vision, the cluster as a supplier to the global community aim to ensure sustainability throughout the entire seafood value chain with a dedicated belief that innovation and knowledge sharing is a contribution.



SDG 14

Conserve and sustainably use the oceans, seas and marine resources.

Through leading-edge technology, innovation perspective, industry driven research and knowledge sharing we utilize our joint expertise to achieve sustainable ocean farming and value creation of marine resources – to protect our ocean resources for the future generations.



SDG 17

Revitalize the global partnership for sustainable development.

As a world leading Seafood Cluster and Norwegian Centre of Expertise, we see it as our natural obligation to facilitate and initiate new partnerships. We acknowledge the pressing importance of sustainable development. This is why we strive to incorporate sustainability in all our projects, interaction, activities and knowledge sharing across every business area.



Special arenas for partners and members

Executive Seafood Forum

In 2019 we launched the Executive Seafood Forum. In this forum the executive leaders of the partners of the NCE Seafood Innovation Cluster meet for inspiration, industry updates, knowledge sharing and discuss strategic topics important for the Clusters future work.

- **Nice to know:** By invitation only for Partners in the Cluster

Partner Meeting

Two times a year, the cluster invites members and partners to meet with other seafood companies. The meeting arena is a networking and knowledge sharing event, where we address and present different areas of sustainability, innovation, digitalization and new technology in the seafood industry.

- **Nice to know:** The event is open for all employees from our cluster partners and members

Resource groups

Three to four times a year, we gather experts and business leaders in resource groups for discussions around our strategic business areas; competence, innovation and entrepreneurship. The resource groups contribute with competence, advise and influence the Clusters focus and projects within each strategic area.

- **Want to know more?** Look at our website or contact the cluster!



“Having an arena for in-depth discussions is really welcome!”

— Bente Torstensen, Nofima

“Meeting colleagues from other companies to find new solutions has been truly inspiring!”

— Johan Kvalheim, NASF

We would like to thank all our partners and members!

INDUSTRY PARTNERS



R&D PARTNERS



MEMBERS



START-UPS



COLLABORATORS



SEAFOOD TRAINEE:

– Seafood Trainee gives us candidates with a genuine interest for the aquaculture industry

As a world leading seafood corporation, Lerøy Seafood has no problem recruiting staff on their own. But they choose to recruit through the Seafood Trainee program.

– We have been very successful at getting great, competent people into our company, says Group Director HR Siren Merete Grønhaug.

Seafood Trainee is NCE Seafood Innovation Cluster's national trainee program, supplying the seafood companies with outstanding professionals with a taste for seafood. Mowi, Cargill and Grieg Seafood are among the other diligent users of the program.

Learning the whole value chain

With 4600 employees, Grønhaug and her colleagues need to recruit a great variety of people every year.

– The good cooperation in the cluster gives the industry a broader perspective. And with this type of program, you widen your search. Therefore, we

get a great variety of candidates with backgrounds spanning from a deep technical knowledge to economists, Grønhaug explains.

83 trainees have so far completed the program, that started in 2016. 33 trainees are now in the fourth group of the program.

– The trainees have gained a very good insight into the industry's value chain, says Grønhaug

And the companies are not the only ones that are happy with the arrangement:

– In general, most of the trainees have been offered a job in the group, says Grønhaug.

– We got a unique insight

Erik Selaas (25) is one of the young professionals who has been a trainee

in Lerøy. With a bachelor's degree in logistics and supply chain management from Molde University College, he secured a place as a seafood trainee.

– During the traineeship we visited many companies and were well received. We got a unique insight in the whole value chain, and the challenges the seafood industry are facing. I also got a lot of new friends and a large network in many different companies, which will be valuable for my career in the business. All in all, I am very satisfied with the Seafood Trainee program, and I will absolutely recommend others to do it, says Selaas.

When his traineeship ended in the summer of 2019, he had already secured a job in Lerøy.

Aiming for 500 applicants

In January 2020 we are starting the recruiting process for the next cohort, and NCE Seafood Innovation Cluster has set the goal to get 500 applicants.

– We are looking for candidates that have just graduated with bachelor's or master's degree and have a maximum of two years of experience, says Benedicte Skogen, who is Competence Manager at NCE Seafood Innovation Cluster.

Access to the best candidates

The Seafood Trainee program is open to all companies that are interested in the seafood industry. The program builds a reputation for the industry and attracts the best candidates for the companies. The trainees stay for one year, and their wages are paid by the companies.

The candidates have a varied educational background: Biology, law, technology, programming, economy,





“We got a unique insight in the whole value chain, and the challenges the seafood industry are facing.”

— Erik Selaas

marketing, communication, fish health and social sciences, to mention a few. The companies choose the competency they need, and what job they want the trainee to do.

The trainees gather for four three-day seminars during the year, to learn about topics like value chains, innovation, sales and marketing, bioprocesses and sustainability.

Going for the Next level

The huge success for Seafood Trainee has urged NCE Seafood Innovation Cluster to establish another program, aimed at more experienced new staff in the business. The program will start in the spring of 2020 and give new employees in the industry a deeper insight into the whole value chain of the seafood industry. It is built on the model of Seafood Trainee but adjusted to suit more senior participants.

– We have experienced that there is a need for increased knowledge for more senior professionals coming into the seafood industry, says Skogen.

Want to know more?

Contact our Competence Manager *Benedicte Skogen*, benedicte@seafoodinnovation.no, or visit seafoodtrainee.no.



AT A GLANCE

Seafood Trainee

- The aim of the Seafood Trainee program is to increase the reputation to the seafood industry.
- Seafood Trainee is organized for the industry by NCE Seafood Innovation Cluster.
- The program is a combination of a job in a seafood company, and an academic program of twelve days spread over four modules in Norway, Brussels and Paris.
- The academic program focuses on increased growth, innovation and sustainability throughout the value chain.
- The Seafood Trainee company can choose between candidates with bachelor or master in biology, technology, fish health, aquaculture, economics, social sciences, marketing and law.
- The program started up in August 2016, and 116 candidates and 25 companies has attended the four cohorts so far.

KABIS:

Sustainable aquaculture growth requires new knowledge

NCE Seafood Innovation’s contribution with establishing the KABIS program has led to an increase in both research and education.

The project started in 2018 to develop research in aquaculture as well as education in the industry, to help develop innovation and restructuring towards recirculating aquaculture systems (RAS) and semi-closed containment systems (S-CCS). Central to the project is NCE

Seafood’s funding of two associate professors. The project also support 1 scientist in molecular biology, 1 senior scientist in early salmon maturation, 1 senior scientist in innovation management, 1 senior scientist in entrepreneurship, 1 senior scientist in complex, interdisciplinary innovation processes and 1 facilitating position has been funded.

Increased research and teaching capacity

Project manager Sigurd Handeland, Associate Professor at the University of Bergen is very satisfied with the progress of the project:

– We have reached a lot of our milestones in the project. Our goal is to build a new research and teaching capacity in our region, closely tied to the new program for civil engineers at the University of Bergen. We want to promote the development of the sustainable aquaculture of the future, says Handeland.

Revised curriculum for students

The curriculums of relevant programs at the University of Bergen and Western Norway University of Applied Sciences



“Our aim is to get the students more actively involved in the industry, but also to get the businesses in closer contact with research and education.”

— Sigurd Handeland

Ongoing Phd. projects:

- Enrique Pino Martínez (2018-2021, UiB), Salmon Aquaculture for the Future.
- Tharmini Kalanathan (2019-2023, UiB), Neuroendocrine factors involved in appetite control.
- Emil Lindfors (2020-2023, UiB). Innovations in modern Aquaculture.
- Patrik Tang (2019-2022). Stress response in Atlantic salmon.



have also been revised to include RAS technology amongst other topics.

Competence on innovation is being strengthened, either through students in innovation and entrepreneurship taking courses in aquaculture, or aquaculture students learning more about innovation processes.

Creating an international program and integrating RASLab

An exchange program between the University of Stirling in Scotland, Universitat Autònoma de Barcelona and several institutions in Bergen is being developed and is another output from the KABIS project.

Marineholmen RASLab will be an important asset to the KABIS project when it is finished in the early summer of 2020, and it will offer opportunities for training and education for professionals from the industry, master's students from the University of Bergen and teachers from vocational schools.

Bridging industry and academia

The KABIS Impact Forum has been established, where stakeholders in the industry give input on what is needed of research and education.

– We hold annual meetings, where we gather the whole consortium. Students

AT A GLANCE

KABIS

The KABIS (Capacity-lift for Sustainable and Innovative Aquaculture Production) project is in its second out of six years.

The project is supported by funding from the NFR FORREGION program as well as partners from institutions and companies within R&D and salmon producers.

The program increases capacity for R&D and education as the new Professor II positions are filled and more and more master and doctor degree students finish relevant projects.

KABIS by the numbers

- NFR support: 55 MNOK
- NCE Seafood Innovation Cluster financial support: 5 MNOK
- Number of industry members: 13
- Number of partners (R&D): 6
- Financial support: The Research Council of Norway, Municipality of Bergen, County of Hordaland

and scientists present the results of their research, says Handeland.

The topics of the students' research has often been proposed by businesses in the cluster.

– The brainstorming afterwards brings about new, interesting ideas for projects, that can become new student research.

The focus is always on what are the most urgent challenges for the aquaculture industry.

– Our aim is to get the students more actively involved in the industry, but also to get the businesses closer in contact with research and education.

Want to know more?

Contact our Innovation Manager Björgólfur Hávarðsson MSc, bjorgolfur@seafoodinnovation.no, or visit kabis.no.



AQUACLOUD:

– Without standardization we will never overcome the problems with fish disease

Better fish health data is crucial to increase production, says Einar Wathne, Chairman of NCE Seafood Innovation and project manager of AquaCloud.

The AquaCloud system for combining data like environmental factors, sea lice prevalence and fish health was launched by NCE Seafood in 2017. The first goal of the project was to make a system for sea lice warning, by combining existing data from different salmon producers.

The operation center which could predict sea lice

Trond Kathenes, Chief Digital Officer in Grieg Seafood, is responsible for all digitalization in the company and also a member of the steering group of AquaCloud.

– AquaCloud works very well. We send data to the database, and we have an API (application programming interface) pulling out datasets every day. If we want, we can display sea lice prediction data for one week ahead on our dashboard, he says. But the sea lice prediction is not yet being fed into the dashboard.

First goal: Sea lice warning

Sea lice warning has been achieved, but only with a 70 percent certainty. For making costly decisions about lice treatment, this might not be good enough for the industry. But to get more

accurate predictions, we must improve data quality and standardize methods.

Some data sources go automatically into the database, but sea lice counts are done manually: 20 fish from each cage are taken up, lice are counted and fed into the database.

– But 20 fish out of maybe 150 000 in a cage is not enough, even though we are working on standardizing the methods of counting, says Einar Wathne.

Data is being gathered from a wide range of cages every day by staff from Mowi, Lerøy and Grieg Seafood, who are running the project, but also Eide Fjordbruk, Lingalaks, Bolaks and Bremnes Seashore.

– I think an accurate lice prediction will depend on the development of a

DATA FROM PRODUCTION AREAS:
12 out of 13 areas

DAILY NUMBER OF DATAPOINTS:
Approximately 140 000

NUMBER OF SENSORS REPORTING:
Approximately 6370

TOTAL DATA INPUTS FROM ABOUT
3250 fish cages

WEEKLY DATA FROM ABOUT
1100 fish cages (2019)

NUMBER OF DATA SUPPLIERS
7 (8 from Q1 2020)



“We depend on a strategy of open sharing because we all operate in the same fjords all the time.”

— Einar Wathne, Chairman of NCE Seafood Innovation and project manager of AquaCloud.

form of automatic sea lice count. We need to get a system that scans the fish, says Wathne. Several tech-companies are working on ways of resolving this issue.

All in the same fjord

Better fish health data is crucial to increase production, says Wathne. He has been overseeing the work on AquaCloud since the beginning and strongly believes that sharing data in an open platform is the only way ahead.

– We need a better picture of the salmon’s health. The interaction between different fish farms is considerable with open cages, says Wathne.

Kathenes foresees AquaCloud as the future national hub for all aquaculture data, used by both industry, authorities and scientists.

– AquaCloud has a great potential for further industrial research, consulting services and machine learning. But we need to say that this is something we

want, and then give full speed ahead, he says.

Wathne agrees, and sees no other solution than more open sharing of data:

– We depend on a strategy of open sharing because we all operate in the same fjords all the time.

Want to know more?

Contact our Innovation Manager Björgólfur Hávarðsson MSc, bjorgolfur@seafoodinnovation.no, or visit seafoodinnovation.no.

AT A GLANCE

AquaCloud

AquaCloud is a big data project anchored in the industry’s need to build better tools for sea lice management. The data uploaded to the platform come from the sites that are in operation by the industry companies. The project started in NCE Seafood Innovation, with cluster members MOWI ASA, Lerøy Seafood ASA, Grieg Seafood ASA, Bremnes Seashore AS, Bolaks AS, Eide Fjordbruk AS and Lingalaks AS.

The scope of AquaCloud 1.0 was to establish a secure database for storing data and to use advanced analytics to identify where sea lice outbreaks were probable.

This part of the project celebrated some success. However, data quality and dependability are insufficient to reach the ambitious goals.

AquaCloud 2.0 is now working on three major workflows:

- Sensor standard – The aim is to develop an open internet of things

(IoT) based standard allowing equal access to aquaculture management systems.

- Health and welfare – health data is presently reported from multiple systems with different suppliers. The scope here is to structure and standardize how data is gathered.
- Environmental monitoring – Having experienced the importance of dependable environmental data the cluster has initiated a total review of an existing standard.

SEAFOOD INNOVATION PLATFORM:

Developing an aquaculture matchmaking service

NCE Seafood is turning matchmaking into a virtue, connecting challenges, solutions and capital in a “Tinder of aquaculture”. The aim is to boost open innovation in the seafood industry.

When the NCE Seafood Innovation Cluster analyzed the existing structures for innovation, they saw a considerable gap between ambitions and reality. If the Norwegian seafood industry shall quintuple its size before 2050, there is need for radical change through innovation for sustainable growth.

Promoting open innovation

Innovation and improvements often happen within different companies,

which hinders them from learning from each other.

– The industry might be characterized by closed innovation, and we need to develop a broader, more open approach for collaboration, says Senior Advisor Solveig Holm.

The team working on improving innovation found that corporate businesses have knowledge about a range of challenges and obstacles for further sustainable growth, but they

have little contact with entrepreneurs and start-ups that propose solutions. They also found that a third group, investors of different scale, are not sufficiently connected to the two other groups.

The NCE Seafood Innovation Cluster team came up with a solution: Using an innovation portal as a tool to match challenges, good ideas and capital.

– It will push the seafood industry towards more openness and innovation for sustainable growth as well as contributing in building new seafood companies, says Holm.

Matchmaking portal

Christian Rangen, an experienced consultant in strategy and innovation, has assisted NCE Seafood developing the Seafood Innovation Portal.

– The technical solution is just a part of a bigger picture. The goal is to change the way the seafood industry innovates, through open processes, says Rangen.

During the last year, he has developed a software which can visualize challenges from corporate companies, solutions from entrepreneurs, and interested investors in one tool.

Rangen emphasizes that this project is not about digitalization or technology:

– It’s about cooperation and development, says Rangen.

The NCE Seafood Innovation Cluster team has so far listed several industry challenges, a large number of tech-companies and startups and around 130 investors of different sizes in the portal.

Increasing competence on investment

To test out the concept, NCE Seafood Innovation Cluster with assistance from Rangen has been running a program for a handful startups this winter, “Are you ready to raise capital?”. Staff from Algaepro, Quantidoc, Seasmart, Wsence, LumniLice and Marine Technology Innovation have



AT A GLANCE

The Seafood Innovation Platform

- The Seafood Innovation Platform is a new project initiated by the cluster.
- The aim is to facilitate matchmaking between challenges and innovative solutions to increase collaboration between corporates, entrepreneurs and capital enabling sustainable growth in the seafood industry.
- A beta software version was developed in January 2019
- By now the cluster has registered
 - ↳ A wide range of industry challenges
 - ↳ Cluster start-up members with innovative solutions
 - ↳ 130 investors in different size and from different regions and nations
 - ↳ Information and overview of public grants



“It will push the seafood industry towards more openness and innovation for sustainable growth as well as contributing in building new seafood companies.”

— Solveig Holm, Senior Advisor

participated in the three months program.

– We have identified a lack of competence on financial plans and growth strategies among large parts of the Norwegian entrepreneurial businesses, says Rangen.

During the “Are you ready to raise capital?” program, the businesses learn how to work smarter to attract investors.

Learning how investors think

CEO Andreas Morland in Seasmart has participated in the program, testing the portal.

– It’s a great idea to pull clients, entrepreneurs and investors closer together in the same tool, says Morland.

The corporate companies of the aquaculture industry are often hard to reach for small startups, but through the portal Morland gets access to information about what they really struggle with.

While entrepreneurs often think locally about capital, it’s useful to see that also global investors can be interested in their projects.

– I have learnt a lot about how investors think, and how it is most useful to approach new investors, says Morland.

Opening the innovation process will also add value to the industry, he thinks:

– Making the information more accessible would be good. Everyone profits from having this information easier to reach.

Ambitions for the portal

The Seafood Innovation Portal will continue to be developed during 2020,

but it won’t be open to everyone, at least not in the beginning.

– The key is to get the partners in the cluster engaged and initiate new collaborations that are of value to our members, rather than being too open too soon. But in a longer perspective, we aim to have an open platform with national and international users, says Holm.

Want to know more?

Contact our Project Consultant
Carl H. B. Haukås,
carl@seafoodinnovation.no.



ENTREPRENEURSHIP:

Upcoming Seafood Start-ups develops in the Cluster

– An ecosystem for start-ups in the seafood industry gives value and boosts entrepreneurship, says Nina Stangeland, Managing Director in NCE Seafood Innovation Cluster. She is enthusiastic about new businesses starting up and contributing with innovative solutions in the industry.

ShrimpVision AS is bridging Norwegian aquaculture technology and tropical shrimps, while Marine Technology Innovations AS have new, sustainable solutions to reduce biofouling. Start-ups can provide new solutions in the aquaculture industry.

The two companies are both results of NCE Seafood Innovation Cluster mission

to build an ecosystem for innovation and entrepreneurship in the industry.

– These are like vitamin injections to the business, as they bring new thoughts about technology and business models and speeds up the pace of innovation in an industry. They also represent a high growth rate and implementation of new technology,

as small companies are shown to commercialize innovation effectively, says Stangeland.

Natural biocides

Marine Technology Innovation AS is one of the exciting newcomers in the cluster, working to solve a growing problem for the aquaculture industry: Biofouling.

– We are trying to reduce marine growth in a more sustainable way. Today's solution is to use copper, which is not sustainable for the environment, says Arnt-Gunther Dietel.

Together with co-founder Raymond Rogne he is working hard to find natural antifouling for aquafarms and other installations.

“I cannot emphasize enough how much faster we reach our goal by being part of the NCE Seafood Innovation Cluster.”

— Arnt-Gunther Dietel

– Our main concept is to combat marine growth, and we believe this is the only way to attain a long term sustainable production, says Rogne.

Copper based antifouling raises concern because of pollution, and the industry need sustainable alternatives.

To assess different natural components MTI has built an accelerator where they can speed up natural growth by adding light, temperature and nutrition.

– One or two weeks in the accelerator equals half a year in the sea, Rogne explains.

Queuing up to cooperate

With this powerful tool they can test a great number of substances, and have so far particularly good results against hydroids, that grow into fiber structures, making them very difficult to remove.

Being part of the NCE Seafood Innovation Cluster is part of MTI's core strategy:

– I cannot emphasize enough how much faster we reach our goal by being part of the NCE Seafood Innovation Cluster. It has helped us enormously with competence, says Dietel.

Their initiative has also been warmly embraced by the industry.

Combining tropics and Norwegian know-how

ShrimpVision represent a different approach to innovation and entrepreneurship by taking existing technology on recirculating aquaculture systems (RAS) and using it in a new market: Production of fresh tropical shrimps on land in Norway.

ShrimpVision has just recently becoming a member of the Cluster, but the history behind the company show that they are a true product of the

different Cluster initiatives. Two of the founders, Tarald Kleppa Øvrebø and Sjur Øyen, are both students in the University of Bergen's integrated master's program on seafood and aquaculture. The program was established as a initiative from the NCE Seafood Innovation Cluster together with cluster partners, and Øvrebø and Øyen are some of the first students to finish their degree. The thought behind the initiative was to make a program tailor-made for fulfilling the industry's need for future competence of new employees.

– Our company is a true child of the different initiatives of the NCE Seafood Innovation Cluster, says Øyen.

Their idea is to produce large, tropical shrimps near the market, exploiting waste heat from local industry.

Internationally, vannamei shrimp production is around 4.1 million tons a year, while salmon is 1.3 million tons. But the shrimp industry is most often based on primitive production methods in open, land-based ponds. It has a reputation for not being sustainable: The ponds contribute to deforestation of mangrove in many areas.

Building ecosystem of entrepreneurship

ShrimpVision will produce shrimps in a sustainable way, but a good business case is even more important.

– We are starting up with shrimp farming because it is the best business case right now. In aquaculture production is intensifying, which can lead to more problems. Therefore, Norwegian technology and resource management can become an export industry, says Øyen.

Nina Stangeland is satisfied that the cluster attracts people and companies with new ideas.

– In the NCE Seafood innovation Cluster we believe that the entrepreneurs have a better possibility for success and faster commercialization if we help them to identify and point in the direction of different players that can contribute with competence, network and capital, says Stangeland.



Events 2020

The NCE Seafood Innovation Cluster is organizing and co-hosting a broad range of events tailored to share knowledge and innovation across the Seafood Industry. At these meeting arenas, we aim to inspire, build networks and to build competence around the Seafood industry.



Find out more about our annual events, and follow us on: web, linkedin and Facebook for other events that we arrange during the year.

Havlunsj

Havlunsj is the vibrant, rapid pulse lunsjevent with topics from different Ocean industries. Here you'll learn something either you're a student or a CEO. Just be sure to book yourself a seat so you'll get your free lunch!

- **Nice to know:** Norwegian language, free of charge and open for all
- **When:** Third Thursday of the month from 11.30-12.30 in Bergen.

Upcoming Seafood Start-ups

This event is showcasing the exciting seafood Start-ups that want to contribute with new technologies, solutions and services to the seafood industry. Here, new ideas meet experts from corporate business. Don't miss out on this unique opportunity to get feedback on new ideas!

- **Nice to know:** English language, free of charge, open for all
- **When:** Autumn event, Bergen

The Ocean

The Ocean is the new arena not to be missed! Here you can find new partners both from the ocean industries and academic institutions, all reaching for new discoveries, connections and collaboration.

- **Nice to know:** English language, booking and open for all.
- **When:** 17-18th of September 2020, Bergen

Seafood Innovation Day

This event is part of the North Atlantic Seafood Conference in Bergen, and national and global Seafood industry meet. NCE Seafood host a entire day where we focused on cutting-edge innovations and start-up businesses.

- **Nice to know:** English language, booking and open for all
- **When:** Seafood Innovation Day 5th of March. North Atlantic Seafood Forum 3.-5th of March 2020, in Bergen.

“There is so much going on, and Havlunsj is a great way to update, while meeting new people.”

— Lars Grønnestad, Vis

“The interest in MTI after the investor pitch exceeded our expectations and the feedback from the panel has been of great value in our strategic planning. Highly recommended.”

— Arnt Dietel, Marine Technology Innovation AS



The Ocean



Havlunsj



The Ocean



Hav møter land



Upcoming Seafood Start-ups

“The ocean is becoming a fantastic meeting point!”

— Sissel Rogne, the Institute of Marine Research



Seafood Innovation Day



Seafood Innovation Day



Norwegian Centres of Expertise
NCE Seafood
Innovation Cluster

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