

Annual Report

2023



Working together
for sustainability
and innovation

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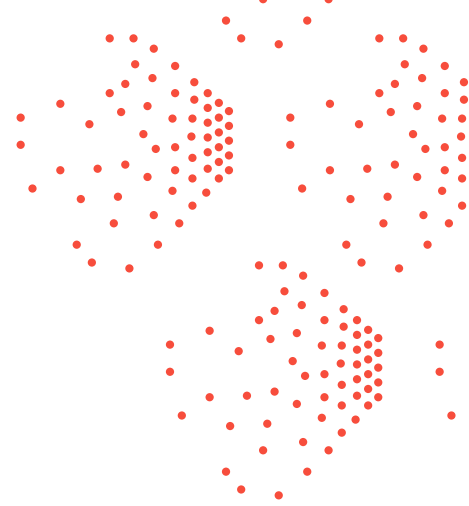
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Managing Director

Motivated to solve our common challenges

The cluster has been through a busy year of projects, events, and the launch of two Industry Insight reports. Building and sharing knowledge and competence have been important this year, and it reflects in the projects we have focused on.

Visions for 2024

Since I started as Managing Director in October, my most important task is to look forward. From all the areas I've worked in, I've seen the need for more knowledge and experienced for challenges we can't solve individually. But a cluster can, and that's what we will continue to do.

We are going to create value and relevance for our members, and initiating activities and projects that stimulate sustainable growth and foster development in the seafood industry. In 2023 the cluster has had a broad strategy, focusing on our five areas of priority:

- Climate, environment, and circular economy
- Digital transformation and digitalization
- Fish health and welfare
- Future feed ingredients
- Future competence and talent attraction

While all of them are of importance, some of them need extra speed going forward.

I want to put emphasis on digitalization, digital transformation, fish health and fish welfare, areas where the industry needs to see development. The benefit is that these areas can influence each other, giving us more answers and solutions.

Develop a new strategy

Our current strategy is from 2022-2024, and we will work together with our members and partners to build our next strategy for sustainable growth and development in the seafood industry.

We are attentive to their needs, and it's important that we spend our time on what matters most to them.



We are thankful for our members and partners motivation and engagement throughout the year, and we look forward to seeing what comes next in 2024.

Trude Jansen Hagland,
Managing Director
NCE Seafood Innovation/
The Seafood Innovation Cluster



Sustainability

Together with our members we aim to fulfil the UN's sustainability goals

We believe that seafood will be part of a future sustainable and healthy food system. Contributing to its development through innovation and collaboration with our members and partners is the most important contribution we can make. Particularly relevant to the cluster's work are the six following goals:



Good health and well-being

Because salmon is a healthy product, the seafood industry has a favourable starting point for contributing to health and well-being. In line with our ambitions of being an inclusive industry, NCE also will work determinedly to secure good health and promote good quality of life for everyone working in the seafood industry.



Industry, innovation, and infrastructure

We are working to promote research and technology development within the seafood industry as well as investments in transport and infrastructure that contributes to sustainable development.



Responsible consumption and production

As a supplier to the global community, the cluster aim to ensure sustainability throughout the entire seafood value chain with a dedicated belief that innovation and knowledge sharing is a contribution.



Climate action

As part of an international industry, we are aware of the importance of making every effort to reduce activities that may have a negative impact on the climate. We work actively for the seafood industry to achieve sustainability at every level while leaving the smallest climate footprint possible.



Life below water

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.



Partnerships for the goals

We see it as our natural obligation to facilitate and initiate new partnerships to reach our goals and the development of our industry.

Board of Directors

New industry insight, members, and management

Another productive year has come to an end for the cluster. In 2023, a major emphasis has been placed on attracting talent and raising awareness among young people about the seafood industry.

The cluster has also shared important industry insight through the launch of two reports: “Data Sharing in the Norwegian Seafood Industry” and “The Future of Plastics in the Norwegian Aquaculture Industry”.

Additionally, the cluster achieved high visibility on social media, hosted attractive industry events, and competence programs. We also welcomed 16 new members and partners throughout the year.

The NCE Seafood Innovation Cluster constantly adapts in line with our members’ needs. This year, the cluster welcomed a new Managing Director, Trude Jansen Hagland, who is motivated to develop the cluster’s offerings, the team, and to encourage innovation through collaboration.

We are confident that she will be a strong leader for the cluster and will further develop our mission.

Einar Wathne
Chairman of the Board,
NCE Seafood Innovation/
The Seafood Innovation Cluster AS



Einar Wathne
Managing Director,
Bioakva Consult



Andreas Kvame
CEO,
Grieg Seafood



Fredrik Witte
Managing Director,
Cargill Aqua Nutrition
North Sea



Anne Hvistendahl
Global Head of Seafood,
DNB



Henning Beltestad
CEO,
Lerøy Seafood Group



Bente E. Torstensen
Division Director,
Nofima

Board of Directors as of December 2023.

Cluster management



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Elise Mangernesnes

PR and Communication
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Kara Kazm

Seafood Trainee - Coordinator
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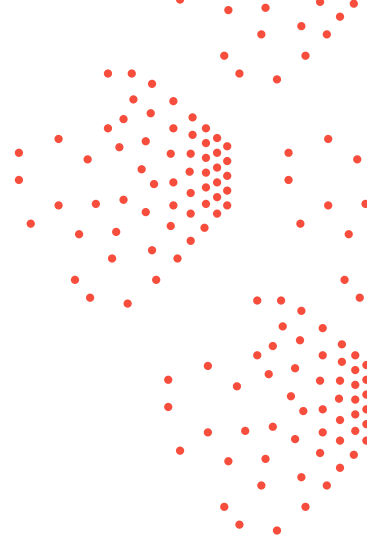
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Trainee
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Synnøve Alise Furnes

Communication and Event
Coordinator
synnove@seafoodinnovation.no



Our co-players

Industry Partners



R&D Partners

BI Norwegian Business School
Institute of Marine Research
Western Norway University of Applied Science (HVL)
NIVA - Norwegian Institute of Water Research
NMBU - Norwegian University of Life Sciences
Nofima AS
NORCE Norwegian Research Centre AS
NHH Norwegian School of Economics
Sintef Ocean AS
University of Bergen
Norwegian Veterinary Institute

Members

Aqua Pharma Group
BioMar AS
BioMega Group AS
Bolaks AS
Bremnes Seashore AS
DSM Nutritional Products AG
Inka AS
InnovasjØ Akvakultur AS
Kontali Analyse AS
LingaLaks AS
Mowi Markets ASA
Norwegian Seafood Council
Nutrimar AS
Oslo Airport City AS
Patogen AS
PwC
Proximar Seafood AS
Ragn Sells AS
Seaborn AS
Sekkingstad AS
SpareBank 1 SR-Bank ASA

Members as of January 31st 2024.

Start-ups

Algena Developments AS
Anteo AS
AquaByte AS
AquaFarm Equipment AS
Aquamedic AS
Aquaticode Ltd.
Bioceanor SAS
BioFishency Ltd.
BioVivo Technologies AS
Blue Breeder AS
Blue Lice AS
BuoyTech AS
Catchwise AS
Circmar AS
Digital Tvilling AS
Dynamic Space Technologies AS
EasyX
Fishency Innovation AS
Fjord Maritime AS
Hauge Aqua AS
Ittinsect
Konree Innovation Limited
Kuehnle AgroSystems
Marimetrics AS
MicroClean AS
Moreld Aqua AS
Nereus Analytics
Nordic USV
Norwegian Mycellium AS
Optimeering Aqua AS
Pronofa ASA
Pure Lobster AS
Quantidoc AS
Remora Robotics AS
Rethink Food AS
Scantrol Deep Vision AS
Sea Farm Innovations AS
Searas AS
Seasmart AS
Smart Ocean AS
Solution Seeker AS
Tekslo AS

TomKat Global Solutions Pty Ltd.
Viking Aqua AS
WellFish Tech AS
W.Sence AS

Risk capital

Farvatn AS
Momentum Venture Management AS
Olaisen Blue AS
Sintef TTO

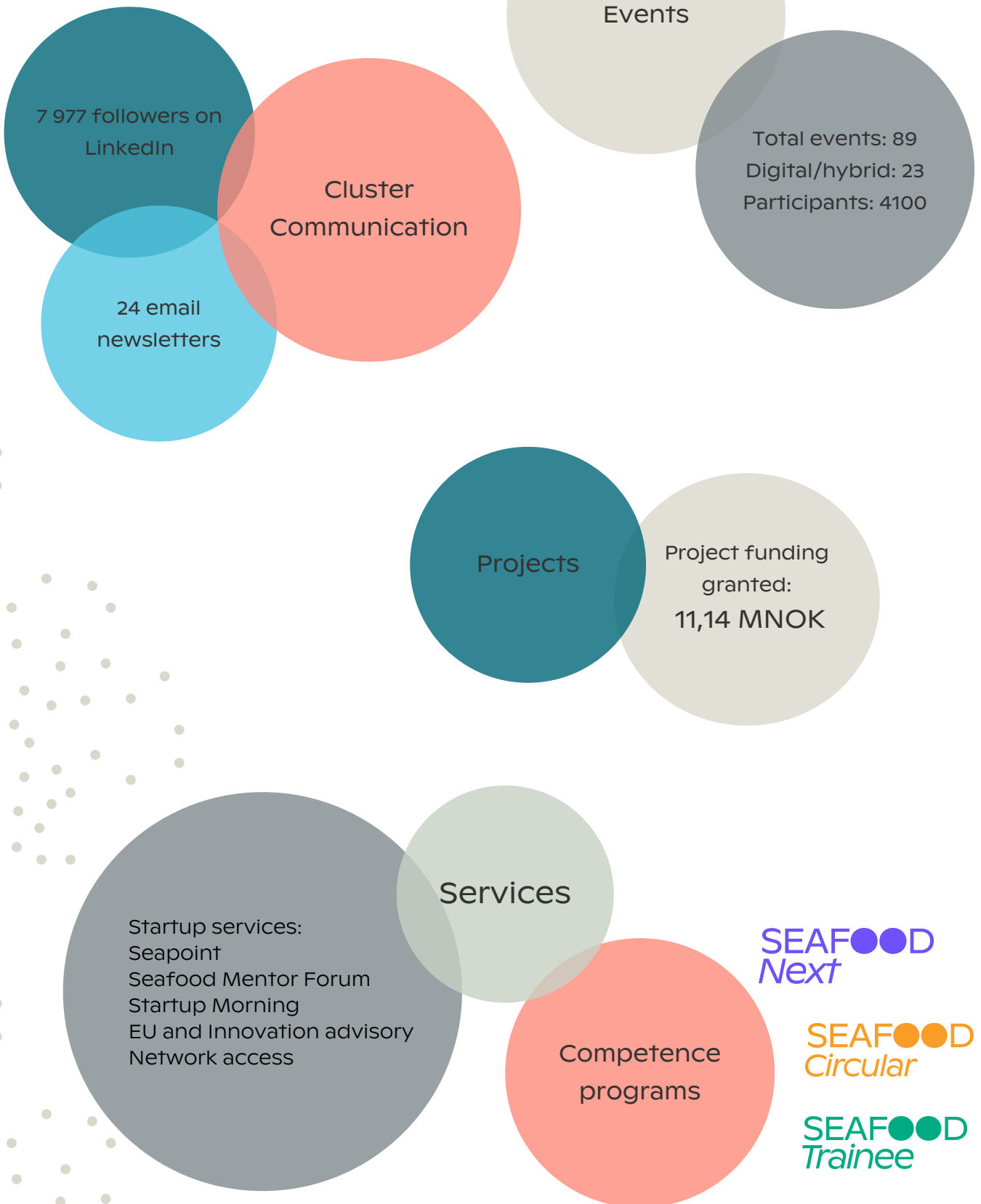
Financial Collaborators

City of Bergen
Innovation Norway
The Research Council of Norway
Siva
Vestland County Council

Cluster-Cluster Collaborators

Biotech North
Centre for Digital Life of Norway
Connect Vest
GCE Ocean Technology
Invest in Bergen
Katapult Ocean AS
Maritime Bergen
Miljøstiftelsen Bellona
NCE Blue Legasea
NCE Heidner Biocluster
Norwegian Retailers' Environment Fund
Salmon City AS
Startuplab AS
UE – Ungt Entreprenørskap
VIS – Vestlandets Innovasjonsselskap

Cluster facts 2023



Highlights from the past year

Seafood Trainee no. 200

In 2023 we welcomed group 8 of Seafood Trainee. Now, a total of 210 trainees have participated in the program since its origin.



Lansering av Fiskehelse rapporten



Visit from the Minister of Fisheries and Ocean Policy

Together with the Norwegian Veterinary Institute and Tekna, we launched the Veterinary Institute's Fish Health Report for 2022. Bjørnar Skjæran, the (now former) Minister of Fisheries and Ocean Policy participated at the launch.

First big focus group meeting

For the first time, we gathered all five focus groups to a joint meeting, to share inspiration and projects across our five focus areas.



AquaCloud got data from 15 companies

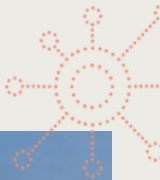
The big data initiative was established in 2017 in order to solve common challenges in aquaculture industry. Six additional companies joined the platform in 2023, meaning over 50% of the Norwegian biomass in place in AquaCloud's data sets.



Upscaling innovation camps

In 2023, we expanded our collaboration with Ungt Entreprenørskap to further develop the work with innovation camps. Our goal, which had increased from 850 participants in 2022 to 1500, was successfully achieved.





We work with

Knowledge sharing to solve common challenges

Insight fosters creativity and innovation, and we believe that sharing knowledge makes the industry more equipped to succeed now and in the future.

This is why we focus on building projects and activities that contribute to increasing knowledge. In the following section, you can read some examples of just that from the past year.



Photo: Praktisk talt plast

Learning from others

Throughout the year, we organize various meeting arenas where we invite experts and industry actors to share their knowledge.

In November, we hosted a workshop and an R&D meeting focusing on gill health in collaboration with our member, PatoGen.

Both the workshop and the meeting were well-received. We discussed challenges, the current state of knowledge, and potential research projects with participants from a broad range of companies.

Knowledge can change habits

Together with Grieg Seafood, Bellona, and NTNU, and with funding from Norwegian Retailers' Environment Fund, we launched a free online course about plastic handling called "Praktisk talt plast".

It is tailor made for the seafood industry and those working with plastic equipment. Knowledge about proper handling and processing of plastic equipment can help reduce pollution and increase recycling.

The project is also a perfect example of how different actors can work together to achieve a common goal.



Meeting to discuss and learn about challenges we have in common can contribute to progress and new solutions. Photos from the meetings about gill health.

Sharing in various ways

In addition to the mentioned activities, we have other highlights from 2023 where knowledge sharing was centered.

- Start-up Morning
- Launch of reports with collaborators
- HAVlunsj
- Webinars and seminars
- Seafood Mentor Forum
- R&D meetings



Sharing industry insight

Two highlights from 2023 is the launch of our new industry insight reports. These are designed to provide effective insights into subjects crucial for addressing our common challenges.

Specifically, the cluster’s five industrial areas of priority are the ones we aim to reflect in these reports, either the current situation or a specific theme within each area.

The first report, focusing on future feed ingredients for Norwegian salmon, was published in 2022.



Dominik Flatten, Project Manager at NCE Seafood Innovation, has been the project leader for both reports. Here, he presented the report on data sharing. *Photo by Elise Mangernesnes.*



May 2023: Data sharing

Built on the foundation of 36 interviews, the report explains the status today, where we are going and how to get there.

Increased data sharing is highlighted as a critical success factor to achieve sustainable growth. Among other things, it can contribute to secure “licence to operate” and deliver on demand for more transparency.

October 2023: Plastic

The report presents an overview of plastic consumption in Norwegian aquaculture and address the barriers and possibilities.

Transitioning to a circular economy, and especially circular utilization of plastic, gives a lot of benefits. According to the report six barriers stand in the way of the transition to a better plastic system.



We encourage

Innovation through collaboration

Together with our members and partners, we foster innovation to build an adaptable and future oriented seafood industry. We collaborate on projects, activities, and meeting arenas to develop new and better ways to solve our common challenges. Our aim is to create spaces for innovation to occur.

Finding solutions across sectors

Acquiring knowledge and working together with other industries can contribute to better solutions. One example is the collaborative initiative [Land Meets Ocean](#) (“Land møter hav”). The initiative was established in 2018 together with NCE Blue Legasea, Biotech North and NCE Heidner Biocluster to strengthen the Norwegian bioeconomy and enable innovation and industrial growth across agriculture, aquaculture, and fishery industries. The project had several highlights in 2023.

In January, Land Meets Ocean contributed with advice to the government about how we should use bioresources in Norwegian industry in a more circular matter.

Another highlight from the initiative is called BlueMusselFeed. Here, multiple companies across blue and green bioeconomy work together to evaluate blue mussels as a possible ingredient in chicken feed. The project aims to increase Norway’s self-sufficiency in food production and is funded by the Research Council of Norway.



Land Meets Ocean and industry partners from BlueMusselFeed on a field trip. The industry partners are Fiskå Mølle, Lerøy Ocean Forest, Eide Fjordbruk, Norforsk, Animalia and Nortura.



Picture above: Focus groups is a meeting arena for discussion, collaboration, and project development. This is from the fish health group in February.

Together with AquaCloud we hosted a webinar about tech innovations and digital strategies in Aquaculture in April. Craig Churchill from Tidal-X, a Moonshot Factory (left) and Trond Kathenes from Grieg Seafood were among the talkers.



Seafood Circular is a competence program where the participants discuss innovations that can contribute to a more circular seafood industry. The picture on the left is from module 2 where they visited Flatøyflu, Lerøy Vest Sjøtroll Havbruk.

– In total, Land Meets Ocean have contributed to getting just under 20 million in project funding, in addition to mobilizing 15 million in contributions from industry players across agriculture, fisheries and aquaculture, Project Developer in Land Meets Ocean, Elise Sæle Dahle, says.

New insight into fish mortality causes

Participating in bigger projects financed by the European Union is one way of collaborating to answer questions and solve challenges. For instance the [NewTechAqua](#) project, which we could share some results from in 2023. .

The cluster is a sub task lead where AquaCloud participated on behalf of aquaculture companies supplying data to the project. Together with the Norwegian Veterinary Institute and IBM they have been working on an upgraded model for predicting numbers of salmon lice in different developmental stages one week ahead.

The insights are used to improve the functionality of the Norwegian Veterinary Institute’s “lice calculator” web application, potentially improving the accuracy and advantages offered by the calculator. Check out our website to read more about the project.

NewTechAqua has received funding from the European Union’s Horizon 2020 Research and Innovation programme under Grant Agreement n* 862658.



Fride Iversen (to the left) and Kara Kazm on one of our innovation camps.

We work to

Attract and build competence

Reports show that the industry lacks competence now and in the following years. Future competence and talent attraction is one of our important focus areas. We approach this challenge on several levels.

Making the industry visible to our future workforce

Attracting new talents to the industry demands ongoing effort, and with input from our members, we have put a strong emphasis on that this year.

Together with Ungt Entreprenørskap, we have increased young people's knowledge about the seafood industry across the Norwegian coast.

In a project called "SMARTere teknologi" over 1000 sixth graders in Bergen municipality have worked with sludge, sustainability, and future salmon farming. To illustrate their solutions, they have built different models of future fish farming facilities.

During the autumn, we went on a tour to do a similar project with high school students. Together with Ungt Entreprenørskap, we arranged "innovation camps" at various schools from Rogaland in the south to Kirkenes in the north of Norway.

They were challenged to solve real challenges from the industry, within plastic, value creation or product development. In total, almost 1700 got to solve industry related issues. Various seafood companies and NHH participated as mentors. NHH also participated to do research on a group development tool called "Start Smart".



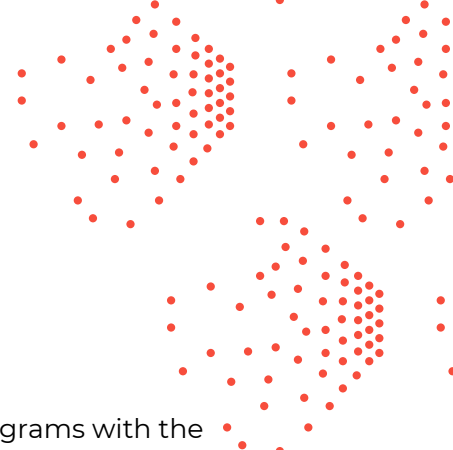
At the final of the municipal selection, the pupils proudly presented their solutions to the former Mayor in Bergen, Linn Kristin Engebø and Fride Iversen, Senior Project Manager at NCE Seafood Innovation.



Photo over: Representatives from NCE Seafood Innovation, NHH, Lerøy Seafood and Ungt Entreprenørskap.

We visited 14 schools throughout the project. On each, we served as mentors for the groups that were working with solving the challenge. The participating seafood companies were also a big help, guiding the students.





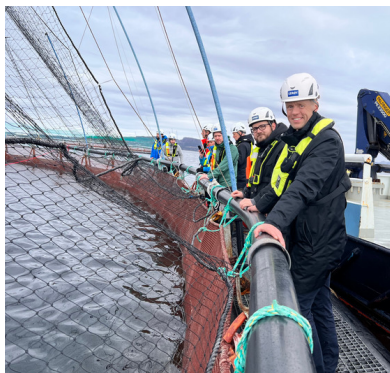
We organize competence programs

To increase knowledge and build network

Over the past years, the cluster has developed variety of competence programs with the overarching objective of attracting talents and enhancing competence within important thematic areas. Whether it is an introduction to the industry or about circular economy, the participants of the programs have acquired more knowledge and an expanded network within the industry.



Seafood Next: Photo Silje K. Robinson



Seafood Circular module 2.



Seafood Trainee module 1.

Increase circularity

With an overall vision to increase sustainability in the seafood industry, we initiated Seafood Circular in 2022. The program aims to provide knowledge of circular economic principles and business models across value chains and inspire to more circular economic solutions in the industry.

It is facilitated together with Sveinung Jørgensen and Lars Jacob Tynes Pedersen, leading experts in sustainable business and circular economy. The program is supported by Vestland County Council, the Municipality of Bergen and BIOSIRKEL. 25 participants from 17 companies were a part of the program in 2023.

Based on this structure, we have developed a special edition, called Seafood Circular Plastics, offering more insight into circular business models around plastics and inspiration to more circular solutions in the industry. This is also facilitated in collaboration with Jørgensen and Pedersen and supported by The Norwegian Retailers' Environmental Fund.

13 participants from 12 companies joined the first course of Seafood Circular Plastics.



Seafood Circular Plastics. From the left: Sveinung Jørgensen, Solveig Holm and Lars Jacob Tynes Pedersen.

Network simplifies collaboration

Seafood Next is a popular competence program for professionals new to the industry and those who just want to expand their knowledge. It is also an effective arena for networking across companies.

A broad network makes it easier to collaborate and learn from each other and can result in projects across companies. In total, 120 have gone through the four modules since the program started three years ago. In 2023 Seafood Next had two parallel groups, with a total of 69 participants.

A popular trainee program

Our one-year program for graduates interested in the seafood industry is called Seafood Trainee. We attract individuals with high motivation and fresh skills, and approximately 80 percent of them remain in the sector after completing the program. In 2023, out of 341 applicants, 27 seafood trainees were selected.

SEAFOOD
Next

SEAFOOD
Circular

SEAFOOD
Circular by
NCE Seafood
Innovation
PLASTICS

SEAFOOD
Trainee

Events and meeting arenas

Brings ideas together

As a member in the cluster you have access to a various of meeting arenas and activities throughout the year.

Focus groups

Experts and business leaders meet in focus groups for discussion regarding challenges the industry is facing. New projects and ideas are discussed.

Executive Seafood Forum

Our partners' executive leaders meet for discussions, inspiration, industry updates and knowledge sharing.

Partners and members meeting

Networking, knowledge sharing and innovation are presented on this meeting, which is open for all partners and members.

Find all our events and meeting arenas on our [website](#).



From the launch of our latest Industry Insight report about plastics in Norwegian aquaculture industry.



Launch of the Fish Health Report. From the left: (former) Minister of Fisheries and Ocean Policy, Bjørnar Skjæran, Ingunn Godal from the Norwegian Food Safety Authority, Torill Moseng from the Norwegian Veterinary Institute, Nina Stangeland from NCE Seafood Innovation and Mattias Bendiksen Lind from Tekna Havbruk og fiskehelse. From the left: Photo by: Silje K. Robinson.



Solveig Holm leading the group within climate, environment and circular economy at our focus group meeting in February. Photo: Silje K. Robinson



Together with EY we launched the Norwegian Aquaculture Analysis 2023.



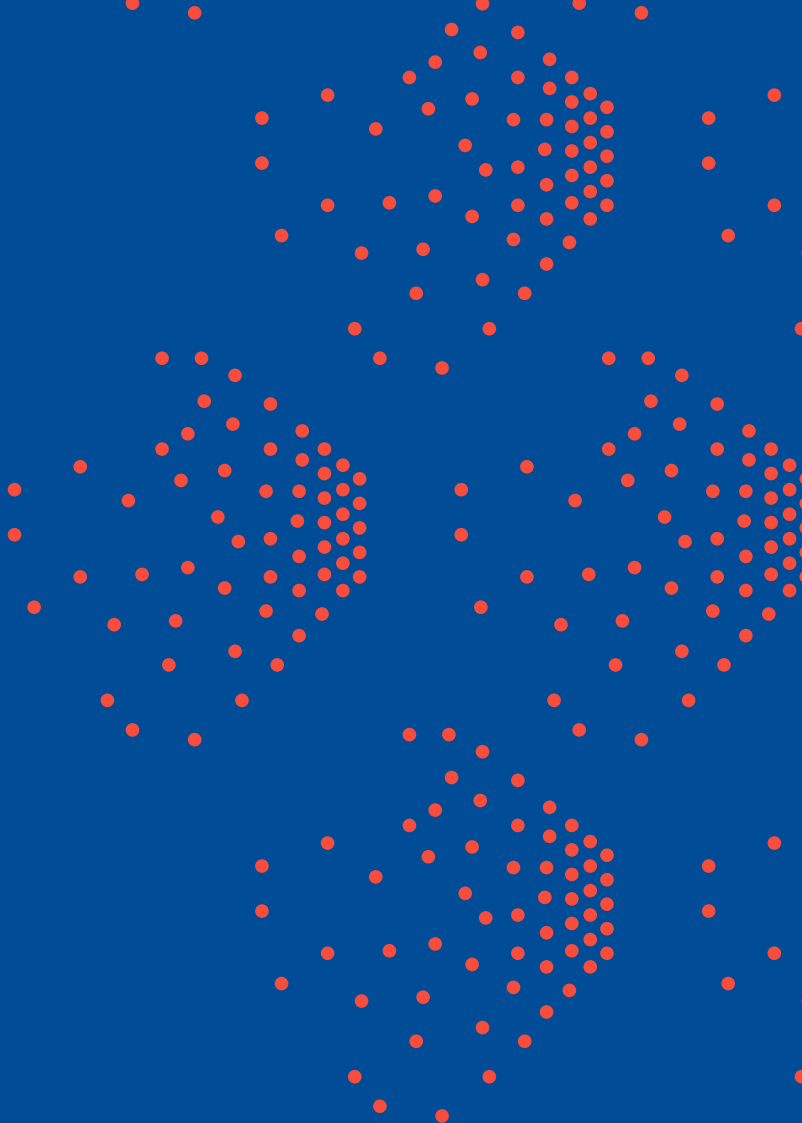
Participants at Seafood Next.



Remora Robotics won the Seafood Innovation Award in 2023.



We participated in the One Ocean Conference. Credit One Ocean Conference.



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