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# LØRN 2021 STORIES

# NCE SEAFOOD INNOVATION



Norwegian Centres of Expertise  
**NCE Seafood  
Innovation**

# NCE Seafood Innovation

Our NCE Seafoods Innovation courses tackle one of the most talked about and discussed topics of the year and asks the question: How can we use digitalization to create and innovate sustainable aquaculture? It is a deep dive into the aquacloud platform and its ability to standardize and provide easy to understand data for everyone in the industry. The digital revolution in aquaculture is taking place right in front of our eyes. This series of courses will give you the insights and knowledge from the one of Norway's biggest sectors through a series of interviews with candid and smart experts, all of whom have weaved themselves into one of today's toughest challenges.



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**OCEANTECH**  
**TROND KATHENES &**  
**JØRN TORSVIK**  
CHIEF DIGITAL OFFICER &  
CEO  
AQUACLOUD AS

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# Digitization and innovation in Norwegian aquaculture

In this #LØRN case, Silvija talks to Trond Kathenes who is the Chief Digital Officer in Grieg Seafood ASA, and Jørn Torsvik who is the CEO of AquaCloud. They will be talking about digitalization in the maritime sector with a specific focus on the aqua cloud. AquaCloud is an industry collaboration for digitization and standardization in aquaculture that was established by NCE Seafood Innovation. AquaCloud works for data sharing and better data quality through standardization in sensors, fish health, and environmental measurements

## About the company

AquaCloud was established in 2017 and is a big data project anchored in the aquaculture industry's need to solve common challenges in order to create sustainable growth.

The project is part of NCE Seafood Innovation and began together with cluster members Lerøy Seafood Group ASA, Grieg Seafood ASA, Mowi ASA, Bremnes Seashore AS, Lingalaks AS, Eide Fjordbruk, and Bolaks AS. The project has developed substantially since 2017, and today the project involves an even broader group of leading aquaculture companies.

## Reflection

An important aspect for AquaCloud is to build a data culture in the aquaculture industry. Why do you think this is important?

Topic

Perspective



Topic: OCEANTECH  
Guest: Trond & Jørn  
Language: ENGLISH  
Perspective: CLUSTER  
Recorded: OSLO  
Host: Silvija Seres

You will LØRN about:

- What is AquaCloud
- Sustainable growth
- Fish Welfare
- Data platforms
- Innovation in the maritime sector

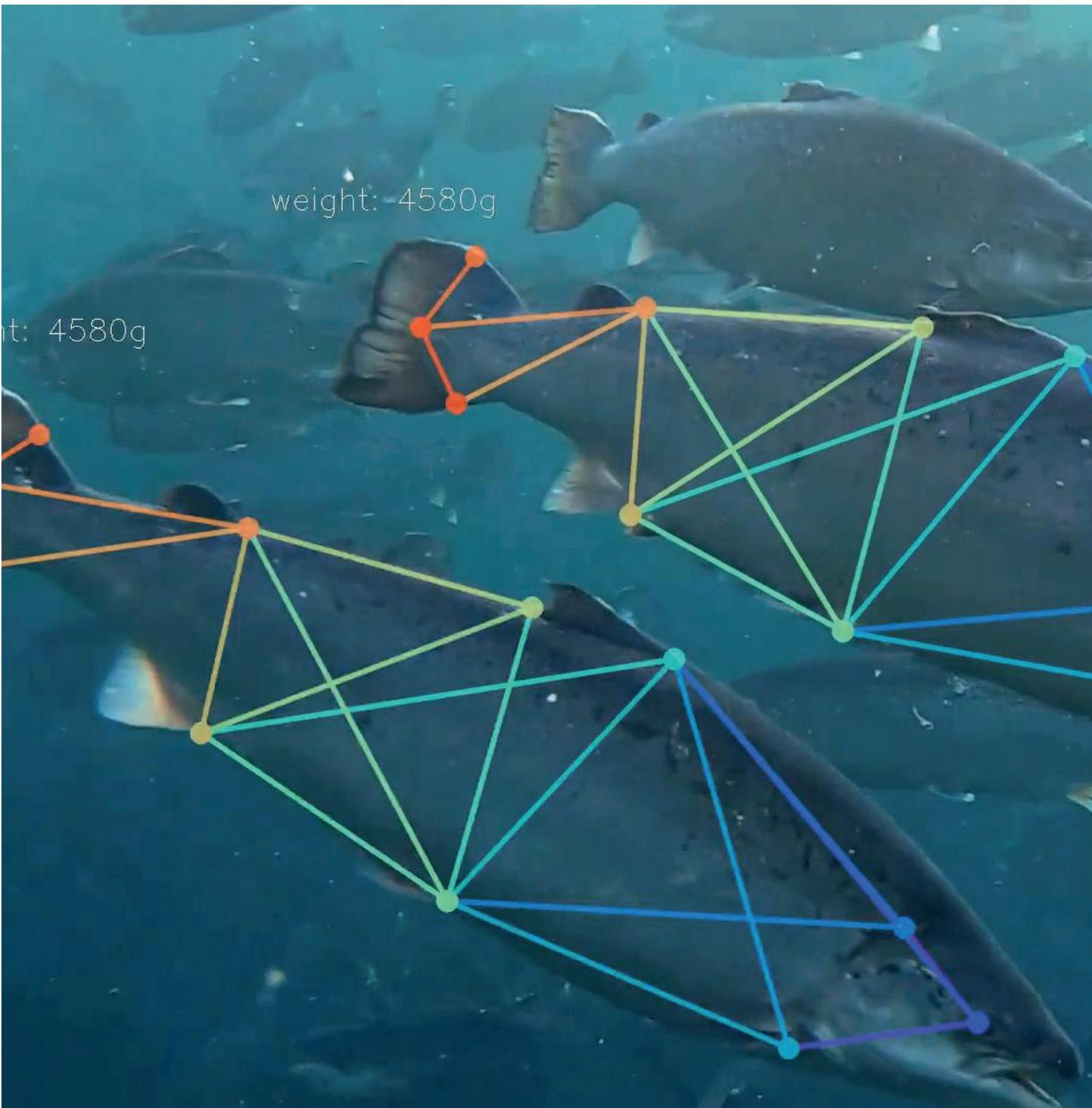
Recommended reading:

- The last book I read was "Jegerånden" by General Eirik Kristoffersen.
- Some principles and values are universal and timeless



**“** Set clear goals for your team and ensure that everyone understands them and their individual contribution.

- Trond Kathenes & Jørn Torsvik



# Interview

----- Trond Kathenes -----

**What does your organization do, and why do people buy from you/ work with you?** Supply the growing market demands for our products. My internal organization supports the business processes with infrastructure and applications for data acquisitions and analytics for insight into critical production/ supply chain processes. This facilitates new knowledge and changes in operational procedures enabling sustainable growth and fish welfare as well as cost-efficient operations.

**What does digital transformation mean to you?** To get an organization to adapt to the use of data, digital platforms, and fact-based insight to develop the business through enhancing people, processes, and technology.

**Your own most important job projects in the last year?** Build global data carrier capabilities, build an integrated operation center for seawater production, and deliver data analysis on fish performance and fish welfare to the business.

**What is relevant knowledge for the future?** Understanding how people interact in the hybrid workspace, and how to create a workspace that thrives creativity and productivity in a frame of stability and continuity, statistics, and mathematics.

**Your 3 best management tips?** Set clear goals for your team and ensure that everyone understands them and their individual contribution. Ensure that your colleagues have the right tools and skills - encourage them to build skills and strengthen their capabilities by introducing external expertise where necessary. Show that you care for your colleagues.

**Any important sustainability perspectives?** Our industry must focus on documenting that our footprint throughout the whole value chain is as little as possible! This can only be done by acquiring data from our own production processes, as well as from all suppliers and their sub-suppliers. These data can only be stored in a block-chain type of structure and be presented on demand from whoever requires them.

**What motivates your work?** By achieving sustainable results on our projects and deliverables. Curious and competent colleagues!

----- Jørn Torsvik -----

**What does your organization do, and why do people buy from you/ work with you?** AquaCloud is an industry standardization and data sharing for sustainable growth.

**What does digital transformation mean to you?** New customer experiences, business models, and revenue streams.

**Your own most important job projects in the last year?** AquaCloud.

**What is relevant knowledge for the future?** Curiosity is more relevant than specific knowledge. What you need to know, will change rapidly over time.

**Your 3 best management tips?** Maintain core values like trust, integrity, responsibility, and courage. Take care of your team and your people. Don't interfere when great people are doing their job.

**What motivates your work?** To have an impact.



# COURSE QUESTIONS

## What was the key industry challenge that initiated the AquaCloud initiative?

- a) Improve production forecasting in the aquaculture industry
- b) Better predict how exposed the fish is to lice at any point in time
- c) Better predict market demand for salmon

## The water column in a fish farm pen can be 50-75 m deep, why is it important to better track, measure and collect data along this column?

- a) At sea, it is an open question of what is coming through the pen and the water quality can vary by depth, capturing this variability is important for building accurate models that explain and predict how the fish behaves and responds
- b) This is because large fish dwell at the bottom while smaller fish are close to the surface and capturing this variability is needed to predict total biomass

## What is the goal of AquaCloud

- a) Build a competitive advantage for the aquaculture industry relative to other sources of food
- b) Understand how the fish grows up so conditions can be optimized to ensure sustainable growth in the industry



**OCEANTECH**  
**TROND KATHENES &**  
**JØRN TORSVIK**  
 CHIEF DIGITAL OFFICER  
 & CEO  
 AQUACLOUD AS

## RIGHT ANSWER

Better predict how exposed the fish is to lice at any point in time

At sea, it is an open question of what is coming through the pen and the water quality can vary by depth, capturing this variability is important for building accurate models that explain and predict how the fish behaves and responds

Understand how the fish grows up so conditions can be optimized to ensure sustainable growth in the industry



**Scan and visit the company**

<https://aquacloud.ai/>



**OCEANTECH**  
**BJÖRGOLFUR**  
**HÁVARDSSON**  
INNOVATION MANAGER  
NCE SEAFOOD  
INNOVATION

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# The value of standardization work

In this episode of #LØRN Silvija talks to the innovation manager at NCE seafood innovation, Björgolfur Hávardsson. Hávardsson describes himself as maniacally interested in fish and explains in the episode why we need a cluster and why he believes that without standardization, all technological development and implementation be very chaotic. He goes on to say that there are two main customer groups that standardization is for, those who develop solutions and services and those who use them.

## About the company

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

They believe that mobilizing joint forces is the way forward, and their cluster contributes through sustainable innovation projects and by facilitating interaction across the industry. Promoting team efforts is a focal point.

## Reflection

How can standardization contribute to sustainable growth across the AquaCulture industry?

Topic

Perspective



Topic: OCEANTECH  
Guest: Björgolfur Hávardsson  
Language: ENGLISH  
Perspective: CLUSTER  
Recorded: BERGEN  
Host: Silvija Seres

You will LØRN about:

- Where the seafood industry want to innovate
- Why standardization is important
- How standardization will improve the ability to develop and collaborate

Recommended reading:

- A short story of nearly everything by Bill Bryson. Why we sleep with Mathew Walker, mind-blowing. Also, Other Minds: The Octopus, the Sea, and the Deep Origins of Consciousness. The podcast Think again! Viewing, Ex Machina, beautiful cinematography, and serious comment on synthetic intelligence.



**“** *We are good, not only because we have a lot of fish and because we have a coast, we are so good first and foremost because we had the curiosity and the guts to try out something so crazy as taking the salmon in a net pen.*  
- *Björgolfur Hávardsson*



# Interview

## Who are you, personally and professionally?

At a personal level, I guess I am the clown, but also a dedicated father and partner. I believe strongly in passion. Do what you do with all you have to give. Professionally, well I am very result-oriented, a believer in working hard and delivering on time and as planned. I soak up information and I have a good big picture understanding and some detailed understanding and then I am lousy at saying NO.

**What does your organization do, and why do people buy from you/ work with you?** In our organization, we work to support sustainable growth in Norwegian aquaculture. We work along three intertwined tracks. Talent development, innovation, and entrepreneurship. Companies work with us because they feel they have a common cause in delivering on our common sustainability ambition, and that we are a company that is achieving something in the field. Some issues are so large and industry-encompassing that one company will not make headway. Together we are strong enough.

## What does digital transformation mean to you?

Digital transformation to me is the ability to learn fast, develop quickly and illuminate the way we approach our work and operations through smart use of technology, but not with a focus on tech. It is a little like electrification. One is not interested in the technology of electrification, but what we illuminate with the light.

## Your own most important job projects in the last year?

I think that must be the “Land meets Ocean” project. We cooperate with three other clusters across food systems and technology to utilize new resources, open hidden doors and stimulate novel growth across all sectors.

## Your 3 best management tips?

Communicate a clear goal. Trust your colleagues. Ask for help/give help when asked.

## What motivates your work?

The joy of learning, of seeing my effort amount to something greater than myself. Also, being good at it!



# COURSE QUESTIONS

## Why do we have an innovation cluster for aquaculture?

- a) There are overarching challenges that the industry faces that are difficult to solve for an individual company on its own
- b) Innovation clusters are the only effective way to drive innovation

## How can sharing of data help fight lice?

- a) Sharing of data on how much antibiotics to administer reduces costs and improves sustainability
- b) Sea lice can spread like wildfire from one farm to another. Sharing environmental data can enable development of "weather forecasts" for the sea that allows farmers to take protective actions

## How can standardization help individual companies?

- a) With well-established standards it is easier to get the different fish farms on the same page that will allow learning from data across their farms
- b) Standardization will give improved market prices for salmon as having consistent sizes is desired by the big food chains in EU



**OCEANTECH  
BJÖRGOLFUR  
HÁVARDSSON**  
INNOVATION MANAGER  
NCE SEAFOOD  
INNOVATION

## RIGHT ANSWER

There are overarching challenges that the industry faces that are difficult to solve for an individual company on its own

Sea lice can spread like wildfire from one farm to another. Sharing environmental data can enable development of "weather forecasts" for the sea that allows farmers to take protective actions

With well-established standards it is easier to get the different fish farms on the same page that will allow learning from data across their farms



**Scan and visit the company**

<https://seafoodinnovation.no/>

## Podcast #0987



**OCEANTECH**  
**GEIR LASSE TARANGER**  
**AND CHARLOTTE DUPONT**  
RESEARCH DIRECTOR AND  
EXECUTIVE DIRECTOR AND  
CO-FOUNDER INSTITUTE  
OF MARINE RESEARCH AND  
BIOCEANOR

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# Environmental data for success

In this episode, Silvija talks to the research director at the Institute of Marine Research (Havforskningsinstituttet) Geir Lasse Taranger, and executive director and Co-founder of Bioceanor in Sophia-Antipolis, in the south of France, Charlotte Dupont. IMR provides data, research results, and governmental advice on fisheries, aquaculture, seafood quality as well as safety, while Bioceanor provides machine learning tools to anticipate water quality in aquaculture. Taranger and Dupont explains what environmental data is, how they use it and why it is important.

## About the company

The Norwegian Institute of Marine Research (Norwegian: Havforskningsinstituttet) is a national consultative research institute which is owned by the Ministry of Fisheries and Coastal Affairs. The Institute performs research and provides advisory services in the fields of marine ecosystems and aquaculture.

Bioceanor has developed AquaReal, the first underwater weather station, to measure and anticipate water quality.

## Reflection

What value do you think can come from being able to reliably predict future water quality (similar to a weather forecast)?

Topic Perspective



Topic: OCEANTECH  
Guest: Geir Lasse and Charlotte  
Language: ENGLISH  
Perspective: CLUSTER  
Recorded: BERGEN,INTERNATIONAL  
Host: Silvija Seres

**You will LØRN about:**

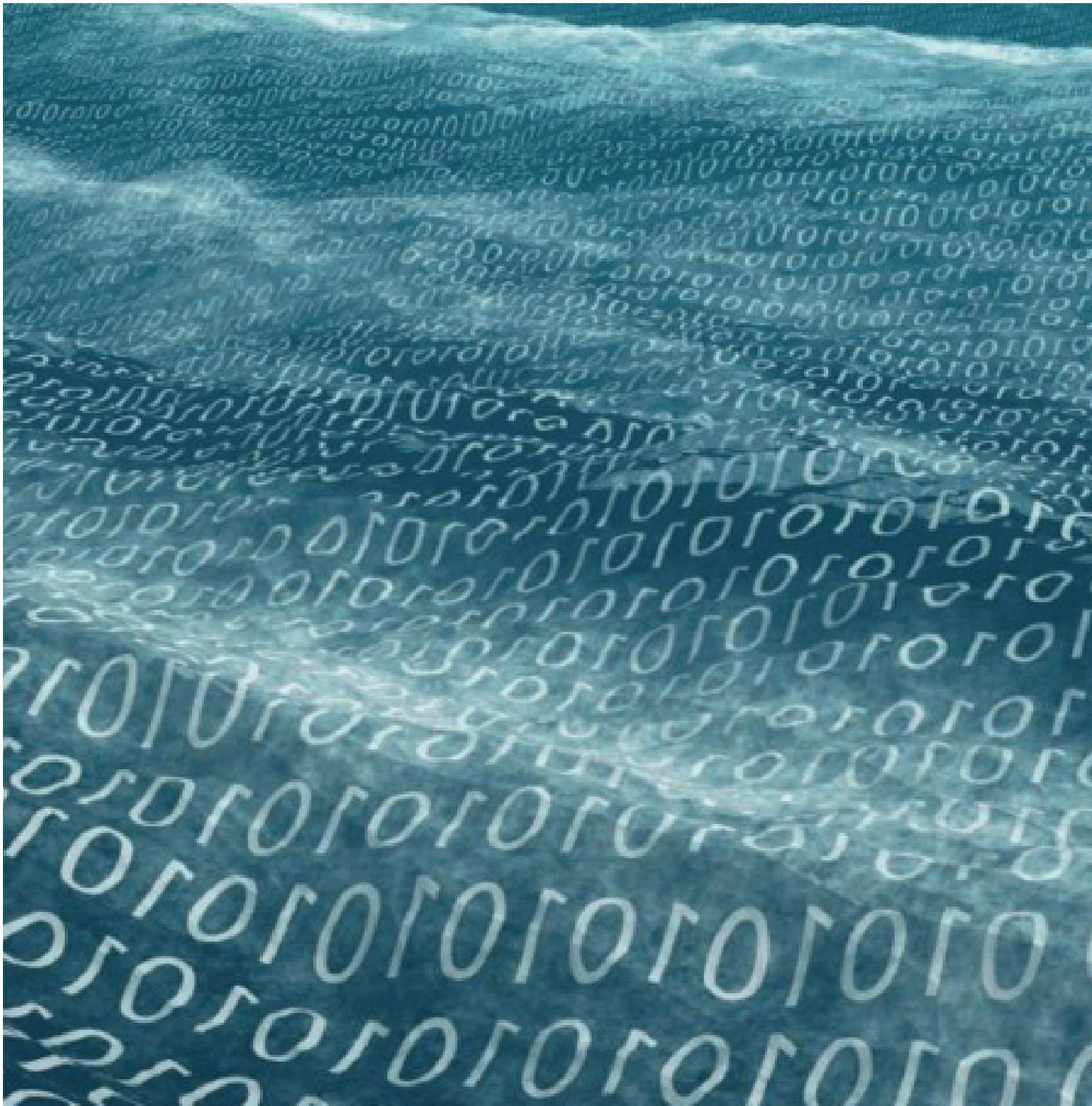
- Why environmental data is important AquaCloud's environmental data.
- What can it predict and describe.
- How to innovate on environmental data.
- Dwell on sea modeling and the possibility of the weather forecast for the sea.

**Recommended reading:**

- I recommend reading The Blue Economy book by Gunter Pauli, our very inspirational mentor, that gives tips to create economical value by taking inspiration into natural processes.



**“** *The ai could open up some new boxes for us as well as some new patterns that we didn't see before*  
- *Geir Lasse Taranger and Charlotte Dupont*



# Interview

## Who are you, personally and professionally?

GT: I am from the fishing community of Austevoll and have a background as a research scientist and research leader for more than 30 years in aquaculture, currently a research director with responsibility for aquaculture, environment, and technology at the Institute of Marine Research (IMR) in Bergen, Norway.

CD: I am 34 years old, in charge of leading operational activities at Bioceanor. I have created Bioceanor in 2017 with my husband Samuel and I am passionate about ocean preservation and new technologies.

**What does your organization do, and why do people buy from you/work with you?** GT: IMR does the ocean, aquaculture, and seafood research and monitoring and is the principal adviser to Norwegian authorities use of ocean and coastal resources. We provide data, research results, and governmental advice on fisheries, aquaculture, seafood quality, and safety, as well as marine ecosystem state and impact of human ocean activities.

CD: Bioceanor provides machine learning tools to anticipate water quality in aquaculture. People buy our products because we can give valuable information about water quality in advance, the anticipation of issues to come, and related advice.

## What does digital transformation mean to you?

GT: IMR gather large amounts of ocean, coastal and seafood data through our monitoring and research activities. In addition to own data, are we receiving data from authorities, fisheries and aquaculture. Data are shared on an international level through the Norwegian Marine Data Centre at IMR, and through the NMDC collaboration. New sensors and analytical methods (such as genomics) result in a massive increase in data amount and the need for better data pipelines and AI interpretation of complex data, e.g. from broadband echo sounders on research vessels, ocean observatories, and in aquaculture experimental cages. We have recently established HI Digital as a new division at IMR in particular to strengthen our digital transformation and use of AI.

CD: For me, digital transformation is unavoidable in any aspect of life. But it has to mean something and be used for a bigger purpose than just being a convenient digital tool. It has to give an added value to the user, like advice and alerts.

## Any important sustainability perspectives?

GT: We travel much less under covid-19, we have to work differently after covid in this regard. Digital communication has improved and contribute to less travel.

CD: We promote sustainability through all our activities. Our investors are impact funds who ask us for strong impact KPI, as much as business KPI. For the

next years we are committed to accelerate the adoption of sustainable aquaculture labels with our customers, giving access to more environmental data to researchers, and to educate about ocean preservation in general.



# COURSE QUESTIONS

## Why is aquaculture in Norway centered around salmon?

- a) Salmon commands the highest price point in the market
- b) Salmon is an easy fish to farm in that the fish start its life in fresh water which is easy to control, before being moved to the ocean

## What can environmental data be used for?

- a) Environmental data can be used to predict and improve the CO2 footprint aquaculture
- b) By understanding the development of environmental data we can take better care of the fish, but also help neighbouring fish farmers take actions

## What are examples of actions that a fish farm can take if there is a forecast of lice increase

- a) The farm can use light and release of feeding at different depths to control at which depth the fish is located
- b) Antibiotics can be added to the feed to make the fish more resistant to lice



## OCEANTECH GEIR LASSE TARANGER AND CHARLOTTE DUPONT

RESEARCH DIRECTOR  
AND EXECUTIVE  
DIRECTOR AND  
CO-FOUNDER  
INSTITUTE OF MARINE  
RESEARCH AND  
BIOCEANOR



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## RIGHT ANSWER

Salmon is an easy fish to farm in that the fish start its life in fresh water which is easy to control, before being moved to the ocean

By understanding the development of environmental data we can take better care of the fish, but also help neighbouring fish farmers take actions

The farm can use light and release of feeding at different depths to control at which depth the fish is located



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<https://www.hi.no/en>

## Podcast #0990



**OCEANTECH**  
**TOMAS FINNØY AND**  
**EMEK SEYREK**  
CTO AND MANAGER/  
CONSULTANT  
FISHENCY INNOVATION  
AND SAITE CONSULTING

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**Fishency**  
Innovation

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# Standardization and Sensors

In this episode of #, LORN Silvija talks to Emek Seyrek, the CTO of Fishency Innovation, and Tomas Finnøy, the manager of Saite Consulting, and consultant to Aquacloud about the challenges involved in processing, collecting, and collating sensory. They explain how standardization can be a vital component in creating effective and usable systems for both the supplier side and the user side in aquaculture. It delves into how exactly the companies involved in aquaculture can gain through having access to the aquacloud and how the whole industry can benefit from its adoption.

## About the company

Fishency Innovation was established in 2017 through X2 Labs Blue Revolution program. They have gathered passion and talent and are committed and motivated to create and deliver an affordable solution based on computer-driven technology. Their mission is to create a digital solution to optimize the use of our fishery resources. They want to replace the current manual inspection of salmon with machine inspection.

## Reflection

How do you think the work to establish a worldwide standard for sensorics can be moved forward at the fastest possible pace?



Topic	Perspective
Topic:	OCEANTECH
Guest:	Tomas and Emek
Language:	ENGLISH
Perspective:	CLUSTER
Recorded:	BERGEN
Host:	Silvija Seres

You will LØRN about:

- Ways to cross-connect
- Scaling up
- Standardized service
- Customized Service

Recommended reading:

- The rise and fall of the third chimpanzee  
Jared Diamond



**“** Focus on the solution, not on the problem!

- Tomas Finnøy and Emek Seyrek



# Interview

## Who are you, personally and professionally?

Emek: Personally, I am a curious science and tech geek, mother of 2 boys, a globe-trotter world citizen. Professionally, engineer/scientist seeking diverse challenges to devise novel solutions, currently CTO and co-founder of Fishency Innovation.

Tomas: Coder, manager, strategist with deep technological roots.

## What is your education and do you have any hobbies?

Emek: Chemical Engineer Ph.D., specialized in biotech. My hobbies include travel and running.

Tomas: BEng in Microelectronics & Software Eng. My hobbies are coding, food, arts, and music.

## What does your organization do, and why do people buy from you/work with you?

Emek: We sell an AI-based fish health monitoring device and service for salmon fish farmers. The farmers need to have healthy fish, that need to be monitored continuously, and not an easy task underwater.

Tomas: Aquacloud's goal is to help establish standards and platforms for better cooperation and data sharing in the Aquaculture industry.

## What does digital transformation mean to you?

Emek: Digital transformation is the biggest opportunity in our world right now, whoever gets on the train earlier will be the winner!

Tomas: Identification and implementation of improved business processes with the aid of digital tools.

## What is the most important project you have worked on in the last year?

Emek: Develop an automated sea lice detection system for salmon farms.

Tomas: Aquacloud Sensor Data Standard.

## Who inspires you?

Emek: Anybody who has a positive impact on our world and environment, regardless of age, size of business, or amount of money involved!

Tomas: People with passion.

## What do you think is relevant knowledge for the future?

Emek: Emotional intelligence and artificial intelligence!

Tomas: Understanding how to navigate the intense information flow today.

## What are the main new perspectives have you gained from Covid?

Emek: Regardless of the many bad things we can say about covid, the increased awareness has made me more hopeful about fighting against global challenges with common activities, like we're doing with Covid, and maybe the same can happen for climate change and the protection of oceans! Hopefully, we won't wait until it's too late.

Another positive perspective: great opportunity to connect bright minds from different places from the Globe, join forces to solve global problems. We have proven that we can work and deliver even if the team is spread out.

Tomas: Old traditions don't fit into the future.

## And finally, do you have any important sustainability perspectives?

Emek: Sustainability starts with good data.

Tomas: Good intentions are not enough.



# COURSE QUESTIONS

## How can a fish farmer think about the benefits of standardization?

- a) It helps guide timing for harvesting to fit with different standard sizes for the fish
- b) Think about an analogy from electricity in your home. Everyone uses the same type of volt and plugs. So when you buy an electrical device you know it will work. A common way for things to interact

## How does Fishency Innovation approach fish health?

- a) Look at the visual aspects of the fish like you are in the lab, but you are not. The fish remains under the water, you don't have to touch the fish
- b) By carefully extracting the fish from the pen, the fish can easily be visually inspected

## Why is it important to collaborate across countries when it comes to standardization?

- a) It is important to push for collaboration across countries so that we don't get competing standards
- b) To ensure that multiple overlapping standards are developed



**OCEANTECH**  
**TOMAS FINNØY AND**  
**EMEK SEYREK**  
CTO AND MANAGER/  
CONSULTANT  
FISHENCY INNOVATION  
AND SAITE CONSULTING



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## RIGHT ANSWER

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Think about an analogy from electricity in your home. Everyone uses the same type of volt and plugs. So when you buy an electrical device you know it will work. A common way for things to interact

Look at the visual aspects of the fish like you are in the lab, but you are not. The fish remains under the water, you don't have to touch the fish

It is important to push for collaboration across countries so that we don't get competing standards.



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## Podcast #0992



**OCEANTECH**  
**SOLVEIG NYGAARD AND**  
**CECILIE WALDE**  
GLOBAL FISH HEALTH  
MANAGER AND PHD  
CANDIDATE/RESEARCHER  
GRIEG SEAFOOD ASA AND  
NORWEGIAN VETERINARY  
INSTITUTE (NVI)

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# Happy Fish – Important?

In this episode of #, LORN Silvija talks to Solveig Nygaard, the global fish health manager in Grieg Seafood ASA, and Cecilie Walde a Ph.D. candidate/researcher at the Norwegian Veterinary Institute (NVI). It is an in-depth look into the biological applications of the AquaCloud, and where, or even if there is a tradeoff between the welfare of fish and optimized production. Silvija's curiosity (especially when it comes to the pure scale, technology, and depth of a fish farm) and the guests passion leads to discussions about how to define a 'happy fish', both psychologically and physically, and what the knock-on effects in the industry will be from a focus on fish welfare.

## About the company

Grieg Seafood is one of the world's leading salmon farming companies, targeting 80 000 tonnes of harvest in 2021 (excluding Shetland, which will be sold when the time is right) and 130 000 tonnes in 2025. Their farms are in Finnmark and Rogaland in Norway, British Columbia and Newfoundland in Canada, and Shetland in the UK.

The Norwegian Veterinary Institute is a biomedical research institute and the national leading centre of expertise in biosecurity in fish and land animals. The aim of the Institute is to become Norway's center of preparedness for One Health.

## Reflection

There has been a lot of progress related to standards for what welfare data to measure, still the data can be measured and registered in different ways across different farms. What challenges can this cause when analyzing combined data sets?



Topic	Perspective
Topic:	OCEANTECH
Guest:	Solveig and Cecilie
Language:	ENGLISH
Perspective:	SME
Recorded:	BERGEN
Host:	Silvija Seres

You will LØRN about:

- Practicalities of fish farming
- Production timelines
- Fish Sensitivity
- Value of Understanding Nature

Recommended reading:

- Solveig: Novels and films about history or foreign cultures.
- Cecilie: Moby Dick by Herman Melville  
Improving the use of economics in animal health - challenges in research policy and education - Jonathan Rushton



“Care and be  
involved  
- Solveig Nygaard and  
Cecilie Walde



# Interview

## Who are you, personally and professionally?

Solveig: I am the Global Fish Health Manager in Grieg Seafood ASA. I have been working with fish health since 1985.

Cecilie: 37 years old, working mum to three small kids, long retired rower at Norwegian national team. Worked with fish health and diagnosing diseases in fish for many years at NVI, and in-field working for Solveig Nygaard actually.

## What are your education and hobbies?

Solveig: Veterinarian, a specialist in fish diseases. Hobbies: outdoor activity, and training, and organizing theatre activities for children.

Cecilie: Master's degree in Fish health biologist from University in Bergen (UiB) and Economy studies at NHH+ UiB+ University in Utrecht. Currently doing a Ph.D. in the field of epidemiology and economy. No time for hobbies with three small kids- sleeping and eating is prioritized!

## What does your organization do, and why do people buy from you/work with you?

Solveig: My department in Grieg Seafood is a support for the production in the 5 regions.

Cecilie: Norwegian Veterinary Institute is a biomedical research institute, and the national leading center of expertise in biosecurity in fish and land animals. The aim of the institute is to become Norway's center of preparedness for One Health.

## What does digital transformation mean to you?

Solveig: Simplifying today's registrations.

Cecilie: Putting numbers on performance/daily activities into databases/surveillance.

## Your own most important job projects in the last year?

Solveig: Standardize internal registrations of fish welfare and evaluation of sea lice treatments. Also, it is important to exchange internal and external information to improve our production,

Cecilie: Published article on mortality after delousing operations as part of the PhD-work.

## What are your main new perspectives gained from Covid?

Solveig: Optimistic for the fall in 2021- and remind myself of new experiences of covid 19.

Cecilie: Not a new perspective, but enforced – preparedness is only a cost when nothing happens, but it's a bigger price to pay, not to be prepared when it happens. An ounce of prevention is worth a pound of cure- Benjamin Franklin.

## What are your 3 best management tips?

Solveig: Interested, open, honest.

Cecilie: Structure, generosity, understanding.

## Any important sustainability perspectives?

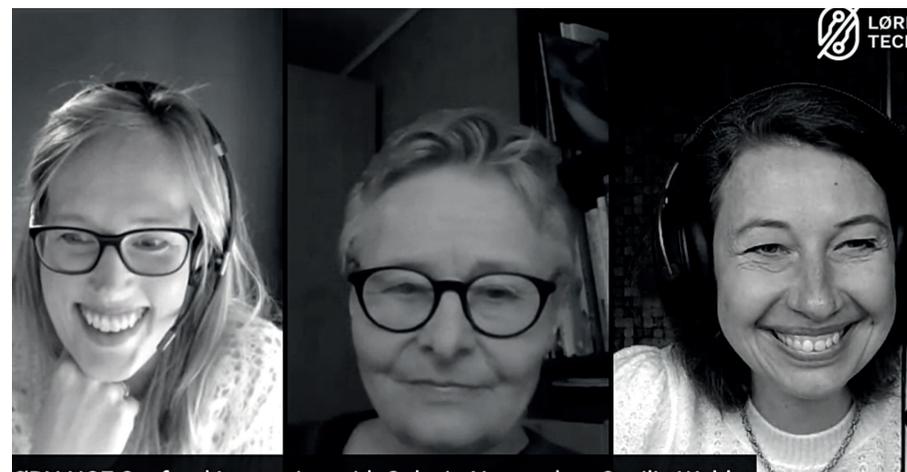
Solveig: We have to focus on sustainability in private and business life.

Cecilie: Regarding aquaculture: Reducing mortality, improving health and welfare.

## And finally, what motivates your work?

Solveig: The feeling to do something useful, and making improvements.

Cecilie: Understanding the linkage and forming a better linkage between biology and economy.



# COURSE QUESTIONS

## What is fish welfare about?

- a) It is about giving the fish conditions so it can grow, not get diseases and allow it to thrive
- b) It is about maximizing production rates

## Why is fish health important?

- a) Because it is regulated by a law
- b) Good fish health is linked to financial outcome, but also we need to care for living beings

## What can be good inspiration for how to deal with problems related to fish health?

- a) It is always good to go back to nature and how the fish has evolved over 1000s of years
- b) DNA research is good place to look for inspiration



**OCEANTECH  
SOLVEIG NYGAARD AND  
CECILIE WALDE**  
GLOBAL FISH HEALTH  
MANAGER AND  
PHD CANDIDATE/  
RESEARCHER  
GRIEG SEAFOOD ASA  
AND NORWEGIAN  
VETERINARY INSTITUTE

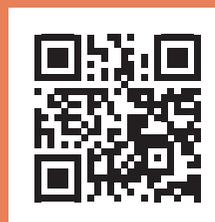


## RIGHT ANSWER

It is about giving the fish conditions so it can grow, not get diseases and allow it to thrive

Good fish health is linked to financial outcome, but also we need to care for living beings

It is always good to go back to nature and how the fish has evolved over 1000s of years



**Scan and visit the company**

<https://griegseafood.com/>

## Podcast #0988



**OCEANTECH**  
**THOMAS AAS AND**  
**BRYTON SHANG**  
FOUNDER AND CEO AND  
MANAGING DIRECTOR  
KONTALI AND AQUABYTE

**Podcasts done in collaboration with:**

**KONTALI**

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# Data from different points of view

In this episode of #LØRN Silvija talks to Founder and CEO of Aquabyte Bryton Shang and managing director in Kontali, Thomas Aas. Both Aas and Shang use AI and big data to help companies make better decisions in aquaculture. They explain how companies can use the quantitative data to innovate and have a more efficient production. Shang says that farmers work with them because they represent the future of aquaculture.

## About the company

Kontali are Seafood experts with the world's most extensive proprietary database covering aquaculture and fisheries. They are there to answer your questions pertaining to the seafood sector.

Aquaculture is one of the world's fastest growing sectors in food production, and offers a meaningful solution to the global food deficit. Their social mission is to use software technology to make food production more efficient, sustainable and profitable.

## Reflection

If you take the view of a fish farmer, what sort of decisions can be improved by leveraging data from AquaCloud?

Topic

Perspective



Topic: OCEANTECH  
Guest: Thomas and Bryton  
Language: ENGLISH  
Perspective: CLUSTER  
Recorded: BERGEN  
Host: Silvija Seres

**You will LØRN about:**

- Mapping stock in fish farming
- AI and BigData
- Innovation
- Using insight to get a competitive advantage
- Fish well-fare

**Recommended reading:**

- Essentialism – great book on how to focus on the right things. Also our TV episode where we brought the CTO of Amazon to a Norwegian fish farm.
- Hans Rosling, Factfulness (but considering the volume of my reading, I should have left this one blank)



**“** *You need to know what you are looking for before you can use the data to start innovate, the clearer the picture of the industry is the more innovation we are able to put into motion*  
- *Thomas Aas and Bryton Shang*



# Interview

## What does your organization do, and why do people buy from you/work with you?

Bryton: Aquabyte builds machine learning technology for aquaculture - automatic sea lice counting, biomass estimation, welfare estimation. Farmers work with us because we represent the future of aquaculture and are the first to allow farmers to achieve dispensation from Mattilsynet (food hygiene) for lice counting.

Thomas: We provide insight and transparency for the seafood industry to give our customers a competitive advantage.

## What does digital transformation mean to you?

Bryton: It means being able to help farmers adopt the latest machine learning technologies to make their farms more efficient and sustainable. For the first time farmers can weigh fish and measure growth in real-time - in the future people will wonder how did we ever grow fish without these types of tools.

Thomas: A catalyst for change and My children's generation must have an education to get a job.

## What are your own most important job projects in the last year?

Bryton: Scale deployments to hundreds of fish pens, obtain Mattilsynet (Food hygiene) dispensation for our customers.

Thomas: Initiating the growth story for Kontali.

## Who inspires you?

Bryton: Elon Musk, Tesla's office is 5 mins from my home in Silicon Valley, they represent the cutting edge in innovation and how it can be brought to a new industry.

Thomas: Colorful people who is willing to take a risk, like Petter Stordalen.

## What is relevant knowledge for the future?

Bryton: Machine learning/ Aquaculture AI.

Thomas: How to use available technology, and how understand and cope with human behavior (People business).

## Main new perspectives from Covid?

Bryton: Importance of technologies that can help farmers during tough times, such as help with mundane activities like automatic lice counting.

Thomas: Yes, video conference works and there will be less travels afterwards. There is actually a thing called "too much family time".

## What are your 3 best management tips?

Bryton: Dive deep and simplify, collaborate as one team, own and entrust.

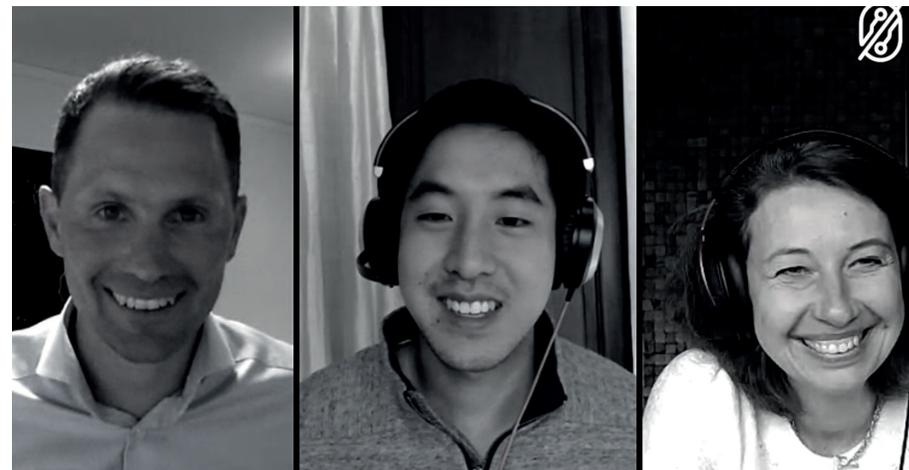
Thomas: The main focus should be long term actions, not daily operations. Recruit a strong team (and pay them 5% extra if

necessary). Growth ambitions must be reflected in the board room composition.

## Do you have any important sustainability perspectives?

Bryton: Sustainability needs to be practical and actionable - how can you promote sustainability on a wide scale? By helping invent and be a part of developing the future of sustainability.

Thomas: Sustainable operations are profitable.



# COURSE QUESTIONS

## What does Aquabyte provide?

- a) Aquabyte develops a new generation of fish feed
- b) Aquabyte uses computer vision to provide automatic sea lice counting, biomass estimation and welfare estimation.

## How can AquaCloud provide value for innovation?

- a) By being very focused on what use cases the data is allowed to be used for
- b) Data analysis across bigger, combined data set provides a better level of insight than what can be done on smaller data sets.

## How can data lead to better decisions in aquaculture?

- a) By relying on data, the need for experience is taken out of the equation
- b) The fish farmers have great intuition about what works. Combining that intuition with quantitative predictions based on data makes for better decisions.



**OCEANTECH**  
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FOUNDER AND CEO  
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KONTALI AND  
AQUABYTE

**KONTALI**

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## RIGHT ANSWER

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Aquabyte uses computer vision to provide automatic sea lice counting, biomass estimation and welfare estimation

Data analysis across bigger, combined data set provides a better level of insight than what can be done on smaller data sets.

The fish farmers have great intuition about what works. Combining that intuition with quantitative predictions based on data makes for better decisions.



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# Lørn manifesto

No one should waste time and money on skills that will soon be useless. We need to learn relevant things for the future we are going into. An advertisement asks: do you think it is about mindset or skillset? The answer is: BOTH! Mindset without skillset is useless; the separation without the mindset is directionless.

Skills for the future will be a combination of technological knowledge and the courage to think for yourself. We must dare to think something about what this future should be like, in order to be able to make active choices. It is too easy to say that "we only teach kids to code". Everyone has to learn and we have to learn more than coding. We need to teach kids and everyone else, DIGITAL CREATION. We must become something more than good consumers of new technology - we must be able to recreate it. And we adults must not tolerate so easily the learning that does not apply to ourselves.

But what are the necessary skills for the future?

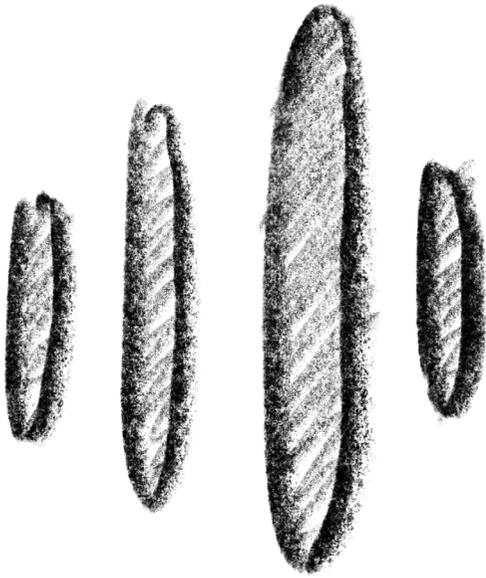
Direct competition against robots is a losing battle for humans. Robots, automation and AI are all about what the machines are very good at. It is to be able to read and find patterns in large amounts of data, but to interpret these patterns correctly, a way that is also culturally and politically rooted, which reflects the extremely complex human psyche, only people can and should do. Better and cheaper robots will be able to perform most of our routine tasks that require little or no creativity. On the other hand, tasks that require flexible action in unpredictable environments, and that require empathy, people will always be better at. AI is well suited for administrative and routine tasks. People are invincible in the tasks that require care and consideration. Either way, it will be exciting and require a lot of new knowledge.

Claude Shannon, the father of Information Theory, said: "We know the past but cannot control it. We control the future but cannot know it ».

Join and explore the future, so that together we can drive it in a good direction.

Founder  
Silvija Seres





**Editor:** Silvija Seres

**Podcasts Production:** Julie Malvik

**Production of book:** Sergio Casado

**Production of course:** Synne Johansen

**Administration:** Andrijana Vukicevic

**Partner:** NCE Seafood innovation



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