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Fish Farm of the Future

Technology is accelerating the pace of change in aquaculture and reshaping the industry’s workforce.

Advocates of land-based aquaculture tout its benefits: traceability, faster fish growth, less environmental risk, proximity to markets. The Monterey Bay Aquarium rates salmon farmed on land as a “best choice.”

But maybe there’s another benefit—attracting employees.

This form of aquaculture is moving from an experimental pioneer phase to large-scale business, according to consulting firm Deloitte. And the US, which imports over 90 percent of its fish, has become the focus of companies, especially from Scandinavia, that want to expand.

Some of these companies are choosing to build close to metropolitan areas. Atlantic Sapphire’s facility in Homestead, Florida, is just 30 miles south of Miami. Whole Oceans and Nordic Aquafarms plan to break ground this year in mid-coast Maine, known for its lobster rolls and craft breweries. And Nordic Aquafarms recently announced a lease option in Humboldt County, California, which is roughly 300 miles from an airport but boasts redwood forests and a university with a fisheries biology major.

All will use recirculating water technology in large tanks—indoors. “It’s a perfect example of where technology meets nature,” says Nordic Aquafarms’ Marianne Naess. Whole Oceans and Nordic Aquafarms plan to break ground this year in mid-coast Maine, known for its lobster rolls and craft breweries. And Nordic Aquafarms recently announced a lease option in Humboldt County, California, which is roughly 300 miles from an airport but boasts redwood forests and a university with a fisheries biology major.

One thing’s for sure. Orange hip waders will not be in the dress code.

The aquaculture’s changing landscape is attracting talent from fields far removed from aquaculture. Take Tony Chen, for instance. The MIT Computer Science graduate was developing software for the US government prior to co-founding Manolin, whose software platform aims to help fish farmers optimize sea lice treatments and improve fish health through data analytics.

“Aquaculture for me is a combination of two of my passions. I studied computer science in college, but I had a passion for fishing,” Chen shares. “My earliest memories are fishing with my dad and I was a competitive swimmer my entire life. I didn’t figure out how to integrate those passions into a career until I discovered aquaculture.”

A visit to Rappahannock Oyster Company in Virginia opened his eyes to how technology could be used to help aquaculture grow sustainably. “They were talking about filter feeders and making protein. I thought this was the greatest thing for the world. Aquaculture seems to be this opportunity where you can combine all that. The ocean can be a solution for food, for energy, for climate change. I think a lot of people who are looking to make a change in this world are starting to recognize that.”

But more than the technology that help aquaculture companies succeed, it is the company culture—whether it’s in Virginia or Bergen, Norway— that inspires Chen. “The salmon industry has grown exponentially over the last few decades but that hasn’t stopped the collaborative culture from being ingrained in each person we’ve talked to,” he wrote in Medium.com.

Bryton Shang is another techie who was unfamiliar with aquaculture before founding Aquabyte in 2017. The San Francisco-based startup helps fish farmers optimize yield and profit through data analytics.

“I came from a computer vision and machine learning background,” the Princeton graduate told the audience at the Animal AgTech Innovation Summit in San Francisco in March. (He founded a company specialized in computer-aided cancer diagnosis using machine learning techniques in 2015). “I actually wasn’t that too familiar with aquaculture before I started. I was interested in applying that to various other industries. Aquaculture is something that I had found out through a previous co-founder of mine and through various investigations of farms here in California, the Pacific Northwest and Canada to, eventually, Norway.”

—Lisa Mayer and Lynn Fantom

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Keys to success, Naess says, are both superior technology and the right people to run it. Cultivation of that talent—with specialized knowledge of water chemistry, mechanical and technological systems, and fish nutrition and health management—may be the hardest part of raising the fish. One thing’s for sure. Orange hip waders will not be in the dress code.

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A visit to Rappahannock Oyster Company in...
Newfoundland steps up efforts to address skills gap

Efforts are underway in the Canadian province of Newfoundland and Labrador to expand its aquaculture workforce. Mark Lane, executive director of the Newfoundland Aquaculture Industry Association (NAIA), says projects such as the Marbase Marystown aquaculture service hub, Grieg’s salmon project in Placentia Bay and the arrival of Mowi in the province make attracting talent to the industry an even more crucial task.

“Thankfully,” says Lane, “we have a provincial government that’s very supportive of the industry. They see the growth potential and want to realize that.”

One of the initiatives is to make aquaculture a standard part of the curriculum in primary, elementary and high school classrooms within the next few years. Both the industry and the province are interested in ensuring that students are aware of the opportunities in the aquaculture industry. Preliminary discussions are already underway with Agriculture in the Classroom Canada to develop an equivalent “Aquaculture in the Classroom” program for the province.

“We need a paradigm shift,” says Lane. “I equate it with recycling. When I was growing up, it was the beginning of the paradigm shift in the way of thinking about recycling. For my kids, it’s a no-brainer; they don’t think about it, it’s just the way we do things. We want aquaculture to be like that.”

There are also plans to engage with students on social media and to develop a high-caliber interactive website for aquaculture. The website would answer any questions about sustainability or traceability, but would also have a youth-engagement component where students can learn about the industry.

Lane also hopes that virtual reality technology can be used as part of these experiences. While the technology is, in Lane’s words “trendy and modern,” it could be used to very effectively demonstrate the vast range of opportunities within the aquaculture industry.

“Once you’re on the farm, you’ll see all these people – you’ll see the captain of a crew boat, you see the farm technician, the farm manager, the nutritionist, the veterinarian. The thing I want to do is show people the different selection of job opportunities out there. Aquaculture is here to stay and it’s growing immensely worldwide. I want to bring that opportunity to people who are passionate about working outdoors and working to produce a sustainable protein.”

In addition to bolstering the homegrown workforce, the province is also looking at ways to bring in skilled workers from other parts of the world. In 2020, a pilot project with Memorial University will begin recruiting some graduates of a marine institute degree program from Tra Vinh University in Vietnam. Five graduates will be selected to work in the industry.

“Thankfully,” says Lane, “we have a provincial government that’s very supportive of the industry. They think about aquaculture, says Mark Lane of NAIA Credit: Adobe Stock

The provincial government engaged McKinsey & Company to “identify further opportunities for the Province’s economic growth, bringing an independent and global perspective to challenge the current thinking and surface new opportunities”.

Mark Lane, executive director of the Newfoundland Aquaculture Industry Association (NAIA), says the report is very encouraging. “The report suggests that our province can and should leverage its favorable ocean conditions to license additional sites, opening new areas to prospective seafood farmers. More importantly the report suggests that governments must ensure that new sites are approved in an efficient, effective and timely manner to encourage further aquaculture development and investment.”

The McKinsey Report on Economic Growth predicts that by 2030, the aquaculture sector could be producing more than five times current volumes, exceeding 100,000 metric tons annually. Fully realized, increased production of sustainably farmed seafood, coupled with a substantially more robust and integrated supply and services network through the value-chain, could contribute up to $600 million in GDP and generate more than 7,000 additional jobs by 2030.

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HR ups its game as aquaculture competes for talent

Recruiting in a tight labor market is an ongoing effort and requires creativity and the adoption of new tools

BY LYNN FANTOM

Jamie Rouleau, who sports a long, blonde braid and pale skin, grew up around Salmon Wharf in Campbell River. His family was involved in the community, his brother and dad. After high school, she worked at a fish processing plant and, as a technician, at a freshwater nursery. Then the site closed.

But with the same company, Jamie was able to transfer to sea sites and was promoted to assistant manager. Curious about First Nations culture, she ventured to the remote BC community of Klemtu and spent the next four years working eight-day shifts and commuting home to Courtenay for six. She was the first woman in a management role on Mowi sea sites.

Today, she has taken on a new challenge: managing marine logistics with specialized software. She works in an office now, but still spends her free time outdoors. Jamie's story, drawn from Mowi Canada West's Wharfside newsletter, tells how tough—physically and socially—it can be to climb aquaculture's corporate ladder. But it also suggests the benefits: a career track with many options, opportunities to learn, and the joy of working outdoors. For aquaculture companies grappling with recruiting, hers is also a lesson in how to get and keep the right people.

Jamie was lucky to grow up near Campbell River, a hub for aquaculture. Many in her generation from other parts of Canada and the US have less awareness of the opportunities in fish farming. Marianne Naess, director of operations, North America, Nordic Aquafarms, says, "It's the industry of the future." In fact, farmed fish production must more than double in the next 30 years to meet the needs of a protein-hungry world.

Not only is aquaculture a growing, changing business, says Dean Dobrinsky, human resources director for Mowi, it also offers many career paths. Mowi's 600 people can work in sea site farming, hatchery production, marine operations, fish processing, and business—or move among them, as Jamie Rouleau did. And those roles can take you to many different parts of Canada and the US, but also to parts of Canada and the US where you can travel to the Pacific Northwest and work in the beautiful surroundings of the Pacific Northwest coastal waters.
Millennials: Consumers of the workplace

Event marketing is one way to burrow into the consciousness of potential recruits, especially millennials. Another is to display socially responsible corporate values. According to a 2016 Cone Communications study, 76 percent of millennials consider a company’s social and environmental commitments when deciding where to work (vs. 58 percent for the US average).

Of course, caring about the environment is core to the business of aquaculture itself, and Taylor Shellfish of Washington State demonstrates a commitment here. When tides aren’t workable, crews will clean the beaches. Taylor also participates in the bi-annual Shellfish Industry Beach Cleanup organized by the Pacific Coast Shellfish Growers Association, contributing people, boats, and lunch.

Similarly, Cermaq is active in improving ocean health. In January, for example, they joined the Coastal Restoration Society and Clayoquot Cleanup in a public meeting to review projects and plans to remove plastic and debris.

Another one of Cermaq’s corporate values is responsibility to society and, in keeping with that, it launched a program this winter to build cultural sensitivity toward indigenous people. In a hypothetical historical village, training participants played roles such as elders, hunters, and children to heighten their awareness.

Harvard Business Review has called millennials “consumers of the workplace” because they will shop until they find positions that fulfill their needs and goals. In addition to targeting this age cohort, though, aquaculture is solving its recruiting problems by reaching out to different segments. A Gen X forklift driver in a warehouse might want to work outdoors, for example. And more and more women are moving into the industry.

Several companies noted that women make up 20 percent of their workforce. And at Cermaq, with its 200 employees, the younger the workforce segment is, the higher the percentage. In fact, women account for 49 percent of millennial (or Gen Y) employees.

RECRUITING: A NEVER-ENDING CYCLE

Staffing businesses like these especially in a tight labor market is an ongoing effort and requires creativity and the adoption of new tools.

For near-term needs, Taylor Shellfish hosts open hiring events. But conscious of the long-term, the HR team participates in job fairs at colleges throughout the Pacific Northwest, as well as high school career fairs. “It gets our name out there,” says Walker. “We’re investing in the future. It’s a never-ending cycle.”

Dobrinsky of Mowi agrees that a good way to source candidates is by building relationships with universities, which Mowi visits sometimes twice a year. The recruiters give “very realistic” profiles of the jobs and answer a lot of questions, he adds.

When Cermaq does its recruiting at career fairs and community events, these days HR is bringing something new, a six-minute movie created in Virtual Reality—plus viewing goggles. “The 360-degree experience is a great way to show the fishing experience,” says Brown.

Brown also invests time into her own LinkedIn page, which she says is “valuable for recruitment.” She may post an inspirational message from Bill Gates, a personal photo from Team Spirit Day showing herself in a sports jersey, or job openings at other companies in Campbell River—or Cermaq, of course. “It is a great way to convey the company’s culture and open a private channel of communication with potential recruits,” she says.

Internships also play a role in a comprehensive recruiting program. Taylor offers a three- to four-month paid internship that teaches people all aspects of working on clam, oyster, and geoduck farms, from planting to maintenance to harvest. Interns work side by side with farm managers. It has proven to produce a good middle-management talent pool, notes Dewey.

Mowi also hires summer interns from which they can pluck viable candidates for long-term development.

Since so much of the workforce is drawn from local communities, the image of these companies is fundamental. And a lot of good work stems from that.

For example, Mowi offers its communities a Salmon Barbeque Event Trailer for local fundraising initiatives. The company provides the trailer, chef, utensils, and all ingredients for a salmon burger or miso salmon salad—even gluten-free options. A local group, whether a sports team or charity, benefits from the proceeds from the food cart sales.
In their daily lives, employees play a role in the community too. “We are the hockey and soccer coaches, the gymnastics people,” says Dobrinsky. “Public outreach is huge for us,” Taylor’s Walker agrees. The farm produces educational videos on how to plant shellfish and publishes informational posts like “What in the ‘sea’ is a geoduck?” It also participates in Pacific Coast Shellfish Growers Association’s Washington Shellfish Week, offering shucking lessons, farm tours, and cooking events.

**HR TECH TOOLKIT EXPANDS**

To onboard employees, farmers like Taylor are taking advantage of online HR systems, although safety training is always conducted in person, Walker emphasizes. Cermaq is moving to an online system that manages everything from goal-setting to paid time off, and Brown points to the convenience that mobile access offers employees.

Mowi has developed a Technician Advancement Program with four levels of education, training, and mentoring that moves employees to a management tier. Participants are evaluated at each level and are also paid more as they advance. An e-learning component is self-driven. “We have to grow our people from within,” Dobrinsky says. But this program is now the model for aquaculture certification at a local college.

In February, Cermaq began new Technicians’ Academies, which are week-long training programs that will be conducted twice a year. Brown, fresh from a management conference herself, says that Cermaq has combined subjects that have been taught in single-day sessions. Employees learn about technology, equipment, safety,
and fish health (they even did a dissection), while experiencing the opportunity to come together as “one company.”

Brown says, “We will always have peer-to-peer and peer-to-manager learning, but we are incorporating more formal knowledge transfer and enhancement. We are just beginning this journey.”

Even as companies are formalizing their training, they emphasize the need to be responsive to circumstances. When Mowi saw an uptick in incidents that had the potential for serious injury, they brought in managers for a one-day “safety training reboot.” Similarly, over the years Taylor has responded to dramatic growth spurts by tapping external training and development resources for classes on communications, moderating disputes, and digital skills.

**IF EMPLOYEES DON’T GROW, THEY GO**

“The workforce today needs more touch points,” says Mowi’s Dobrinsky. Employees are looking for training but also the coaching to help them understand where it will take them. Introducing more regularly scheduled career counseling is on Dobrinsky’s docket for this year.

At Grieg Seafood, HR Manager Alina Constantin meets with every new employee after 30 days with the company. Since 2017, she has been refining all employee job descriptions, as well as the performance appraisal system. “This makes it clear what employees have to achieve before they can get to the next level,” she says. “If they can’t see where they can grow, they go somewhere else.”

The job descriptions include both technical and behavioral competencies. A technician, for example, must be able to lift at least 50 lbs. But all employees at Grieg must build behavioral skills appropriate for their positions. Developed with organizational consultant Korn Ferry, these include how well a person makes decisions, demonstrates accountability, deals with change, and is engaged and eager to grow.

Grieg measures that employee engagement company-wide by sending its 150 employees a Gallup survey that asks 12 questions such as “Is there someone at work who encourages your development?” and “Does the mission of the company make you feel your job is important?”

From results, the leadership team can develop relevant programs to improve engagement. This Gallup employee engagement research has been conducted with more than 35 million employees and, among other findings, shows that companies in the top quartile of engagement scores have 70 percent fewer safety incidents than those at the bottom.

Clearly, aquaculture companies are addressing their workforce needs with ingenuity and investment. Part of the solution has been increased automation.

Taylor, for example, has perfected a clam harvesting machine based on one originally designed to dig tulip bulbs. And they have sourced innovative equipment from all over the world, such as Italy and France. Technology has also been reshaping salmon farming. “It wasn’t so long ago that fish were fed from a bucket,” says Dobrinsky. Today there are state of the art, computer-driven systems with real-time monitoring to feed the fish but also provide aeration, light, and waste management.

Even as technology advances, finding the right people will remain a priority, Dobrinsky says. What are companies looking for? Passion is the quality that resounds in aquaculture career talk—passion about the product, co-workers, the community, and the environment.

Brown clinches it: “We are looking for people who want to be part of a solution: we produce food.”
Biopharmaceutical company Merck Animal Health has announced its Aqua Care365 initiative to support fish farmers in their efforts to provide the best quality care for their operations.

The program includes a series of employee training modules featuring industry experts, interactive quizzes, standard operating procedures (SOPs) and certificates of completion to document training. Free access is available at AquaCare365.com.

“Aqua Care365 is all about supporting farmers and helping them to either develop or reinforce a culture of welfare in their operations,” said Tim Kniffen, technical services manager at Merck Animal Health. “Covering topics important to fish farming provides valuable information to help reduce stress and prevent diseases, which are essential for a healthy food supply.”

Professor Jimmy Turnbull of the Institute of Aquaculture, University of Stirling will teach the first educational training module focused on normal and abnormal salmon behavior. The videos on these lessons are about five minutes long. “Employees need to be trained so they know when to report abnormal behavior, as it may require immediate intervention for the health of the fish,” Turnbull said. “Salmon farmers are interested in having this type of a program available for themselves, for their employees and new employees coming on board,” said Kniffen about the choice to start with salmon. He said topics were developed in collaboration with salmon farmers and veterinarians. “The first priority in the care series was determined to be an understanding of fish behavior.”

The company said it will soon develop training modules on the topics of sea pen handling and farm fish examination.
Disbanded group leaves funds to aquaculture students

Aquaculture students at North Island College in BC will benefit from the donation in the form of tuition discounts
Credit: North Island College

Aquaculture students at North Island College (NIC) in British Columbia are the lucky beneficiaries of $110,000 from the British Columbia Aquatic Food Resources Society (BCAFRS). The organization was dissolved in 2017 and bestowed its remaining funds to support students interested in aquatic sciences at NIC. "The aquatic resource industry is an important contributor to the local economy and we wanted to support students interested in contributing to it in a sustainable way," former BCAFRS president Monty Little said in NIC’s website.

The school will use some of those funds as a subsidy to allow students in their aquaculture program to save $1,000 on tuition. While the tuition subsidy is the only specific use of the funds announced to date, it will not solely be used for that purpose, says Randall Heidt, vice-president-strategic initiatives for NIC. "There are other avenues for us to use the funds: we can support aquatic research projects and we can also support science students who aren't necessarily in the aquaculture program," he says. The school will use some of those funds as a subsidy to allow students in their aquaculture program to save $1,000 on tuition.

Cornell University offers RAS short course online

Cornell University is ahead of its time in offering courses on recirculating aquaculture systems (RAS). While the aquaculture industry is only beginning to use RAS in raising fish to market size, Cornell has been teaching RAS courses over the past 25 years. It taught the course at various locations in the US, including the Conservation Fund’s Freshwater Institute in Shepherdstown, WV and at Hubbs Sea World in San Diego, CA. It has also offered the course overseas, including Canada, Mexico, Chile, South Africa, Germany, Ecuador and Finland.

The classroom-based RAS course is now available as an online course. Developed with eCornell.com, students anywhere in the world can now avail of the course at www.eCornell.com/ fish. The RAS eCornell course covers topics that are written about in the seminal industry textbook, Recirculating Aquaculture-4th edition, written by Timmons, Guerdat and Vinci. These include:
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Spurred by the success of these courses, eCornell.com has launched an online course in fish health management and economic and risk evaluation. The course includes more than 11 hours of video lecture content that are integrated with a slide-show lecture. There are quizzes throughout, culminating in a comprehensive exam. More information about the eCornell RAS course is available in a short video on youtube.

"This self-paced course explains the basic engineering principles behind a successful RAS design," says Dr Michael Ben Timmons, who led the development of the course. "The objective is to provide sufficient information so students will be able to design, construct, and manage their own RAS system. Basic principles of business management and securing investment capital for the small family farm will also be reviewed."

At the conclusion of the course, students will have received the essential information necessary to design their own system and have fundamental knowledge of the principles influencing the numerous design options, Timmons added. As part of the course fee, students will get a copy of the electronic version of the textbook Recirculating Aquaculture-4th edition.

An aquaponics course is in the works at Cornell University to complement the online RAS short course
Credit: Cornell University

We help you find the right people, at the right time, in the right location.
The latest Gallup poll on “employee engagement” in the US – defined as workers who are involved in, enthusiastic about and committed to their work and workplace – shows the percentage of “engaged” workers is 34 percent. According to Gallup, organizations that are best in engaging their employees achieve more than four times the earnings-per-share growth of their competitors.

The figure is the highest since the polling company began reporting on it in 2000. The findings suggest that the rest of US workers (53 percent and 13 percent respectively) are either “not engaged” – those generally satisfied and do the minimum required, but will quickly leave their company for a slightly better offer; or “actively disengaged” – workers who have miserable work experiences.

Mike Freeze, co-owner of Keo Fish Farm Inc of Little Rock, Arkansas, knows only too well the importance of employee engagement in one’s business. The company has its roots in a family business started by couple Cleo and Martha Melkovitz in the 1960s. Freeze became a partner in the business in 1986, a year after Cleo was killed in a plane crash. The business is a case study in social capital, defined loosely as shared values and understandings that enable groups to trust each other and work together. With the help of 17 employees, including Freeze and Cleo’s wife, Martha, the company now accounts for 80 percent of the market for hybrid striped bass fingerlings in the US, and

Employer in Focus: Keo Fish Farm

‘Valuing your most valuable asset’ is more than a cliché at the company.

Some of Keo Fish Farm’s employees. When employees live in the same community where they work, it fosters the wellbeing of the individual, the company and the whole community, says Mike Freeze.
also dominates the triploid grass carp market. “Your employees are your most valuable asset ever,” Freeze tells Aquaculture North America (ANA). “One should never forget that. You want your employees to work there, you want them to feel like they’re vested in your company.”

Enhancing employee experience to engage and retain their talent is Freeze’s philosophy as an employer. Keo’s profit-sharing plan enables its workers to feel more vested in the company’s overall success, giving them the initiative to go above and beyond one’s job. “When our employees are loading fish on a truck and one of them spills fish, I don’t say a word to him, but the other employees are going to say: ‘Hey, you need to be more careful!’ Because that is profit they co-own, through our profit-sharing plan,” Freeze says.

Staff members have 25 days annually to take as personal time, including 10 during the Christmas holidays. Paying workers a living wage that will give them a decent quality of life is a win-win for both employees and employers, Freeze adds. “I laugh when people talk about paying employees minimum wage. Yes, maybe you could hire somebody for minimum wage. But people work so they can have time off and be with their family and do things they want, and if they’re not making enough money to do that, they’re not going to be happy and you’re not going to keep them,” he says.

Measuring employee accountability can be a difficult task to accomplish, but at Keo Fish Farm, staff does not have to clock in and out. Instead, they have devised a way to hold them accountable. “Occasionally, you’ll have a little bit of an issue with some not showing up on time because they’re not punching a time clock. But instead of calling them out, they pay $10 into a pot that’s divided among the employees at the end of the year. So it’s almost comical – they’ll sit there with a watch, trying to see if any employee comes in late. It’s just a way you motivate your employees. Instead of penalizing them, you’re rewarding them.”

Hiring a local talent pool is a priority for the company. Freeze believes it is essential that employees live in the same community where they work because it fosters the wellbeing of the individual, the company and the whole community. Looking closer to home for new talent also makes vetting candidates easier, he says. “When we have an opening, my workers are not going to recommend somebody who is not a good worker or has a drug problem because they don’t want to have to work with someone like that, otherwise they’re going to have to pull his weight.”

“We are one of the few farms that actually use local labor,” he emphasizes. “There’s nothing wrong with H-2A workers (foreign temporary or seasonal agricultural workers), but when you use H-2A workers, there’s a whole set of federal regulations one has to follow. There’s whole different set of headaches. When you use local workers, there’s another set of challenges, but it’s because most of them become like family. If their children are sick, or they’ve got a problem, you’re going to have to address that. I can’t tell you the number of times I’ve had some employees coming to me to talk about marital problems, financial problems. I’m like a father or grandfather to them in a lot of ways.”

“We have very very low turnover,” adds Freeze. However, he said he’s now faced with an aging workforce; a situation he calls his biggest challenge. “So I’m trying to bring in some newer guys that have worked with us in the summertime. We hire quite a few high school guys, many of whom may go on to college but keep working with us while they’re in college. After college sometimes they go on to another career but sometimes they stay with us.”

Freeze says the company has tried partnerships with universities via internship programs to bring in talent but sometimes they stay with us.”

“Your employees are your most valuable asset ever,” Freeze tells Aquaculture North America (ANA). “One should never forget that. You want your employees to work there, you want them to feel like they’re vested in your company.”

Enhancing employee experience to engage and retain their talent is Freeze’s philosophy as an employer. Keo’s profit-sharing plan enables its workers to feel more vested in the company’s overall success, giving them the initiative to go above and beyond one’s job. “When our employees are loading fish on a truck and one of them spills fish, I don’t say a word to him, but the other employees are going to say: ‘Hey, you need to be more careful!’ Because that is profit they co-own, through our profit-sharing plan,” Freeze says.

Staff members have 25 days annually to take as personal time, including 10 during the Christmas holidays. Paying workers a living wage that will give them a decent quality of life is a win-win for both employees and employers, Freeze adds. “I laugh when people talk about paying employees minimum wage. Yes, maybe you could hire somebody for minimum wage. But people work so they can have time off and be with their family and do things they want, and if they’re not making enough money to do that, they’re not going to be happy and you’re not going to keep them,” he says.

Measuring employee accountability can be a difficult task to accomplish, but at Keo Fish Farm, staff does not have to clock in and out. Instead, they have devised a way to hold them accountable. “Occasionally, you’ll have a little bit of an issue with some not showing up on time because they’re not punching a time clock. But instead of calling them out, they pay $10 into a pot that’s divided among the employees at the end of the year. So it’s almost comical – they’ll sit there with a watch, trying to see if any employee comes in late. It’s just a way you motivate your employees. Instead of penalizing them, you’re rewarding them.”

Hiring a local talent pool is a priority for the company. Freeze believes it is essential that employees live in the same community where they work because it fosters the wellbeing of the individual, the company and the whole community. Looking closer to home for new talent also makes vetting candidates easier, he says. “When we have an opening, my workers are not going to recommend somebody who is not a good worker or has a drug problem because they don’t want to have to work with someone like that, otherwise they’re going to have to pull his weight.”

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Freeze says the company has tried partnerships with universities via internship programs to bring in talent but found that housing interns could be a challenge. “We were using interns from Scotland at one time. But when you’re in an area where it’s really difficult to find housing, that becomes a problem. So we just try to get someone locally.”

– Liza Mayer

Mike Freeze, co-owner of Keo Fish Farm Inc. Enhancing employee experience to engage and retain their talent is Freeze’s philosophy as an employer.
On-campus hatcheries offer hands-on learning

With access to two on-campus hatcheries, the experiential learning within Fleming College’s Aquaculture Co-op program ensures students have a head start on their career.

The Co-op program puts Fleming College in a unique position of offering the only aquaculture program offered as a post-graduate certificate in Ontario, Canada. The program is compressed into one year of study, including a paid, eight-week co-op.

The program is located at Fleming’s Frost Campus in Lindsay, Ontario. Its strong industry connections ensure students experience first-hand several aspects of the aquaculture industry.

Students get an opportunity to practice their skills and gain real-world experience at the salmonid hatchery and the alternate species hatchery on the campus.

“The Aquaculture program at Fleming is unique because it offers a lot of hands-on learning. The students are actually in the hatchery 12 hours a week,” says program coordinator Jon Carter.

As students progress through the program and gain confidence in their skills, they take on a supervisory role and run the hatchery with faculty oversight.

“Hands-on work in the hatchery enables students to learn more and gives them the practical experience before getting into the industry. One can actually work with fish and learn more about them at different stages of life,” says Lenora Dias, Aquaculture program graduate.

Employers are noticing the high quality of Fleming Aquaculture graduates.

“Industry is looking for our students all the time. In fact, multiple employers from British Columbia, the Yukon, and the Maritimes, as well as local producers in Ontario are seeking our graduates. They are keen to recruit our students,” says Carter.

For more information about the program, visit: flemingcollege.ca/programs/aquaculture

Online course offerings expanded

A new course called “The Health and Welfare of Atlantic Salmon” has been added to the range of flexible, online courses available on The Fish Site. The course is being offered in conjunction with the FishVet Group.

The new course has been designed for fish operatives who are responsible for the health and welfare aspects of farmed salmon, helping to ensure that fish are free from disease and suffering whilst also promoting good productivity and compliance with legislation. Students can study anytime at their own pace and on any device with internet access.

A variety of courses – from MScs, to introductory courses, to compliance training – have been developed with the University of St Andrews and UMass Boston and are available also at thefishsite.com/learn.

“Anyone looking to accelerate their career in aquaculture or break in to the industry should be able to find the right course for them,” says Jim Muirhead, Director, 5m Publishing, which publishes The Fish Site.

The University of St Andrews offers both postgraduate and undergraduate courses in sustainable aquaculture and students can also take individual modules, which can contribute towards a postgraduate qualification. Courses are taught via an online e-learning platform offering online tutorial support, direct email contact with tutors, video streams and access to student bulletin boards. The structure allows students the maximum flexibility to complete their studies while continuing in their employment.

UMass Boston offers an online undergraduate certificate – Introduction to Sustainable Marine Aquaculture. There are two routes, either for-credit, or non-credit. The for-credit route is ideal for anyone interested in a career in the aquaculture industry and provides many opportunities for students to explore aspects of the field. The non-credit certification enables individuals to quickly gain basic knowledge for entry into the workforce.

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For more information on enrolling, internships, educational opportunities, visit: aquaculture.uwsp.edu | uwsp.edu/aquaponics or Contact: Dr. Chris Hantle, chair@uwsp.edu

University of Wisconsin Stevens Point

Read these and more intern’s success stories on our webpage aquaculture.uwsp.edu click on Past Interns Tab
One-of-a-kind learning experience

The University of Wisconsin-Stevens Point has a unique workforce development program that utilizes a state-of-the-art research facility known as the UWSP Northern Aquaculture Demonstration Facility (UWSP NADF). The research facility, along with the UWSP aquaculture education courses, incorporate key concepts for educating a skilled workforce, including hands-on experience and applied learning. Through industry applied research projects, students work alongside expert staff to raise a variety of species at all life stages in various systems.

This opportunity is achieved through internships and technician positions to create a unique and qualified skillset, which is recognized by industry partners, leading to job placement rates of over 90 percent.

UWSP graduate Brandon Gottsacker is overseeing the largest aquaponics system in the world, as president of Superior Fresh, LLC. The Hixton, Wisconsin-based company is also the first in the US to raise Atlantic salmon to market size in recirculating aquaculture systems. “UW-Stevens Point guided me towards this exciting young industry by providing me unique opportunities to learn about aquaculture,” said Gottsacker.

He and his team have partnered with the UWSP Northern Aquaculture Demonstration Facility for research, technical assistance, demonstration and cold-water species expertise to advance their facility and operations. UW-Stevens Point is also partnering with others to provide intern, technicians and further support staff. “UWSP has rigorous curriculum in biology, fisheries and aquaculture. I am confident in hiring students that attended UWSP,” Gottsacker added.

An as part of a grant-funded project to advance aquaculture and aquaponics workforce development, UW-Stevens Point and industry partners were able to accept six internships in 2018. The UWSP students were stationed at various facilities including UWSP NADF, UWSP Aquaponics Innovation Center, USFWS National Fish Hatchery and Superior Fresh, LLC. Student Brianna Dunbar had the opportunity to intern at Superior Fresh. “This facility is on the cutting edge of recirculating aquaculture and aquaponics technology. I was able to assist with practices unique to Superior Fresh and participate in the first ever harvest of land-based Atlantic salmon in the US,” said Dunbar. Upon graduation, Dunbar will be continuing her path in aquaculture with Superior Fresh. “This was an amazing experience for me and through this internship I discovered what I want to do for a career.”

For more information visit aquaculture.uwsp.edu.

Four fisheries labs give university leading edge

Idaho is the nation’s largest commercial producer of rainbow trout and is central to the recovery of many endangered and threatened fish stocks. This uniquely positions the University of Idaho as a destination institution for student training and research opportunities in Aquaculture and Fisheries.

The Aquaculture Research Institute at the University of Idaho is nationally and internationally recognized as a leading institution that provides academic and research training in all areas of Fisheries and Aquaculture. Undergraduate and graduate degrees are linked to Fisheries and Aquatic studies within various colleges and departments including Fish and Wildlife Sciences, Biology, Animal and Veterinary Sciences, etc. This creates exciting opportunities for students seeking careers in Aquaculture and Fisheries.

There are four fisheries laboratories (three on campus and one in Southern Idaho) that set the university’s programs apart from other peer institutions. Such unique facilities allow hands-on training for students at the University of Idaho’s unique facilities allow hands-on training for students.

University of Idaho’s faculty are central to the research needs of state and federal agencies, private industry, and Native American tribes in the Pacific Northwest. Current strengths and specific areas of expertise of associated faculty are focused in many areas of research, including:

- Fish Nutrition
- Fish Health/Immunology
- Fish Ecology
- Fisheries Management
- Fish Genetics
- Fish Reproductive Biology
- Fish Physiology
- Limnology
- Water Resources/Hydrology

For more information for Aquaculture Programs at UI, go to www.uidaho.edu/aquaculture; or contact director Ronald Hardy, rhardy@uidaho.edu, 208-837-9096, ext. 1105, or associate director Kenneth Cain, kcain@uidaho.edu, 208-885-7608.
Delivering education through collaboration

Excel Career College (Excel) entered the aquaculture market as an HR disrupter. It wasn’t uncommon a decade ago for aquaculture employers to hire unskilled labourers then do the skills development training and industry certifications in-house. Employers across British Columbia were seeing the writing on the wall that this method was far too risky and cost prohibitive, particularly with the skills and labour shortage being predicted.

Through a great deal of industry consultation, Excel launched its Aquaculture Technician Diploma Program with tremendous placement success. One employer hiring an Excel graduate saved the company roughly $5,000 in training and certifications. Industry employers to hire unskilled labourers then do the skills development training and industry certifications.

The aquaculture labour market continued to struggle as the growth in the industry was putting tighter constraints on the recruiting process. Excel, in partnership with the BC Salmon Farmer’s Association, was able to secure a Labour Market Sector Solution contract that funded the training and placement of 60 technicians across Vancouver Island.

Collaboration with industry and community advisory councils as well as direct involvement in the programme with tremendous placement success. One Excel launched its Aquaculture Technician Diploma Program with tremendous placement success. One employer hiring an Excel graduate saved the company roughly $5,000 in training and certifications.

Excel’s strong suit is collaboration with the aquaculture industry is one of Excel’s strong suit, Excel Career College’s (Excel) entry into the BC aquaculture sector. Excel’s capability to deliver customized, industry-relevant training in any location has made a significant contribution to managing the growing skills and labour shortage in BC’s aquaculture industry and the entire labour market.

Building skills capacity in communities through collaboration with the aquaculture industry is one of Excel’s strong suit. Excel Career College’s (Excel) entry into the BC aquaculture sector. Excel’s capability to deliver customized, industry-relevant training in any location has made a significant contribution to managing the growing skills and labour shortage in BC’s aquaculture industry and the entire labour market.

Training the next generation

As the world’s population grows, it is more imperative than ever to have a safe, healthy and sustainable source of food for people around the globe. Aquatic species – including fish, shellfish, and plants and algae – are essential to feed this growing population.

The Fisheries & Aquaculture Sciences program at Bellingham Technical College (BTC) is dedicated to educating students about the immense value of these aquatic resources. Through science-based and hands-on learning, students are able to help manage and conserve those resources through sustainable farming and harvesting.

BTC’s Fisheries & Aquaculture Sciences program imparts the knowledge needed to help manage and conserve aquatic resources. BTC’s Fisheries & Aquaculture Sciences program imparts the knowledge needed to help manage and conserve aquatic resources.

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Alyson Brown, a student at the Atlantic Veterinary College (AVC), University of Prince Edward Island, will spend the summer working on a research project investigating the impact of accelerated climate change on Atlantic salmon aquaculture in Atlantic Canada.

The project is part of the College’s veterinary student research awards (VetSRA) program, which is designed to give students a solid foundation in research. It was developed by Dr Mark Fast, associate professor of fish health at AVC, and collaborators at Memorial University and the University of Waterloo.

“Accelerated climate change is predicted to result in rapidly changing water conditions, like increasing water temperatures and low oxygen levels,” says Fast. “In some areas, water temperatures are forecasted to increase by 2-4 degrees C over the next 20 to 30 years. These changes may push the Atlantic salmon outside its optimal physiological range during the summer, negatively impacting fish health and production – and ultimately the sustainability of the industry.”

Fast wants to develop a “road map” for the adaptation of salmon aquaculture production to climate change, and for the better management of fish health and diseases. To do this, he wants to identify Atlantic salmon families that have enhanced capacity to adapt to environmental challenges and mount strong pathogen-specific immune responses. He also wants to evaluate the effectiveness of current ISA vaccines at elevated temperatures, and how pathogens will respond to climate change.

Brown will work with Fast at AVC’s aquatic animal facility and with industry collaborator Mowi at Huntsman Marine Science Centre, New Brunswick, to test the impact of high temperatures and low oxygen on disease-resistance in salmon.

Brown, who earned her Master of Science degree under Fast’s supervision, wants to work in aquaculture after she graduates in 2022. She enjoys the diversity of the aquatic animal health aspect of veterinary medicine.

“As an aquaculture vet, I could play a key role in making sure our fish and shellfish are healthy and sustainable. This would involve disease surveillance and prevention, sampling fish and water, and providing treatment when necessary. I love that this discipline allows for a balance between hands-on animal care and diagnostics,” she says.
A good diver is worth their salt when it comes to getting the stock grown and off to market, writes Kelly N. Korol.

By nature of farming in the water, there are numerous tasks that need to be tended to that are under the site. This is the domain of the aquaculture diver. These divers use scuba and surface supplied diving apparatus to access the underwater area of the site and perform work and observe and report on the health of the herd in its environment.

Not only is the role of the aquaculture diver technically challenging and interesting, it is rewarding to be very hands on in caring for the flock.

One needs to first become a certified diver to get on the dive team. Aquaculture divers are required to become certified as commercial diver. Recreational certification doesn’t cover the “occupational” aspect for the work practices, safety and demand of work.

Aquaculture divers are required to learn the academics of diving, which include the physics and physiology of diving, use of decompression tables, dive medicine and accident management as well as equipment and industry regulations.

In addition to theoretical diving knowledge, dive students have to be well versed in the practical use of the dive equipment in various water situations including currents and poor visibility. Depending on the training standard, divers are required to accumulate bottom time at various depths, doing tasks or projects that they will be required to do in the field. Practical training also includes topside duties such as dive tending, tank filling and equipment maintenance.

During dive training the divers just don’t blow bubbles; they learn and practice work skills, which will come in handy when they get down to the job site under the farm. Dive students learn many crucial skills. The most important, arguably, is knot tying and rigging. Divers need to have a strong ability to tie a number of different knots as well as work with rigging tools, wire rope, chain and shackles. Underwater net sewing is also a skill students must master.

To ensure student divers are able to tie knots in all situations, DiveSafe International has the students complete a “Blacked-out knot-tying test.” Student divers wear a full-face mask and have audio communications with a topside instructor. The full-face mask is blacked out with duct tape so the diver is effectively blind folded. The student is then told to tie an assortment of knots and the instructor examines each knot. This exercise ensures that the diver can tie most common knots by feel and in a zero-gravity environment.

In addition to knots, rigging, net and rope work, divers are taught underwater video and still imaging, inspection techniques and report writing. It’s one thing to observe the scene underwater but it’s important that the diver is able to document and describe the situation to the site managers and head office.

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A generation of aquaculture Extension professionals in their 50s and 60s plan to retire in the next 10 years and their departure could leave a skills gap if not addressed sooner, a survey suggests.

The projected departure of over half of the surveyed aquaculture professionals creates an urgency to attract people into the sector, particularly when the US government is boosting funding in farming fish, shellfish and seaweed, says Sam Chan, a watershed Extension specialist with Oregon Sea Grant, who helped conduct the survey. “Given the number of upcoming retirements, the window is becoming increasingly narrow for current Extension aquaculture specialists to recruit, train and mentor new professionals,” said Chan, who is based at Oregon State University.

Extension is a university-based, nationwide program that provides research-based information, educational opportunities, and technical expertise to help people, communities and businesses solve problems and be successful. Its aquaculture experts have expanded markets, trained workers on using new technologies, informed consumers about the nutritional benefits of seafood, and analyzed the economics of raising certain species.

Chan noted that the work that Extension professionals do has expanded in scope in recent years, opening up more career opportunities in Extension services. But while universities earlier hired mainly those with specialty in nutrition, genetics and fish/shellfish culture, professionals from other fields are now needed, he says.

“The survey revealed that aquaculture Extension professionals are increasingly called upon to develop programs and provide assistance in navigating regulations, planning, business and understanding human perceptions. Therefore professionals are needed from other fields to serve as part of integrated Extension teams,” says Chan.

He noted however that those with interest in aquaculture would be ideal candidates. “Challenges (in filling positions) might be overcome by integrating aquaculture into more disciplines relevant to aquaculture so students become familiar with it, and a commitment by universities to fill pending retirements,” he says.

Faculty with Oregon Sea Grant, Kentucky State University and the University of Idaho conducted the survey.

**SURVEY: Aquaculture Extension workforce is aging**

Their departure will have significant implications in Extension services. 

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