Making Optimal Harvest and Stocking Decisions

Optimeering Aqua's decision support platform, powered by Gurobi, helps farmers make decisions that can save hundreds of thousands of dollars a week.

Optimeeringaqua

Optimeering Aqua is on a journey to transform the aquaculture industry from being experience-driven to knowledge-driven. They create digital decision support tools that implement advanced mathematical, OR, and AI/ML algorithms to enable this change. This allows for better management of farms to ensure long term sustainability in the industry.

Industry: Agriculture
Location: Europe
Use Cases: Cost Reduction, Operations, Resource Optimization
Website: www.optimeeringaqua.com

Results

- Platform boosted to deliver fast, optimal harvest and stocking recommendations
- Optimal recommendations save farmers hundreds of thousands of dollars each week

Aquaculture continues to be one of the fastest-growing food production sectors, accounting for roughly half of all global fish production. Also known as aquafarming, the practice involves the controlled cultivation of fish, crustaceans, algae, and other aquatic organisms.

Much like traditional agriculture, aquaculture farming decisions involve many complex variables –including biology, production logistics, and production economics data. To make the best possible harvest and stocking decisions, farmers need to take all of these variables into consideration on a daily basis.

Optimeering Aqua strives to help fish farmers make better harvest and stocking decisions through the power of mathematical optimization. Their platform, powered by Gurobi, provides farmers with an easy-to-use tool that delivers fast, optimal recommendations—so farmers can maximize revenue and harvest the right fish at the right time.

What Optimeering Aqua Needed

Each day, fish farmers receive hundreds of new data points that provide insights into the fish's environment, eating habits, mortality rates, and more. Based on that data, farmers must decide which fish to harvest.

With up to fifteen million fish spread across 40 farms, that's a lot of information to take in—and without the right tools, all of that data can create more challenges than insights. Many farmers still rely on a combination of historical time series data, experience, gut feeling, and often Excel-based tools as they try to make the best calls for their businesses.

To help farmers make better-informed decisions, Optimeering Aqua pulls that data into a mathematical optimization model that can deliver a set of recommendations. Those recommendations help farmers make critical decisions—such as how many fish they should harvest on a specific day that week and which pen they should select fish from.

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Erlend Torgnes
CEO and Founder, Optimeering Aqua

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To run their model, Optimeering Aqua needed a powerful solver that could quickly and accurately identify the best solutions. Although they had previously used FICO Xpress, the speed wasn't adequate for their needs. While it could help with long-term planning projects like budgeting, its speed and precision weren't enough for the farmers' short-term projections.

“There were some other tools on the market when we entered, but they were still in pretty rough stages—meaning farmers were only able to use them for some strategic, long-term decision-making,” said Erlend Torgnes, CEO and founder of Optimeering Aqua. “But we developed a much more detailed model that more closely mimics how the farming operation works, and that has enabled the farmers to use our tool on a daily basis.”

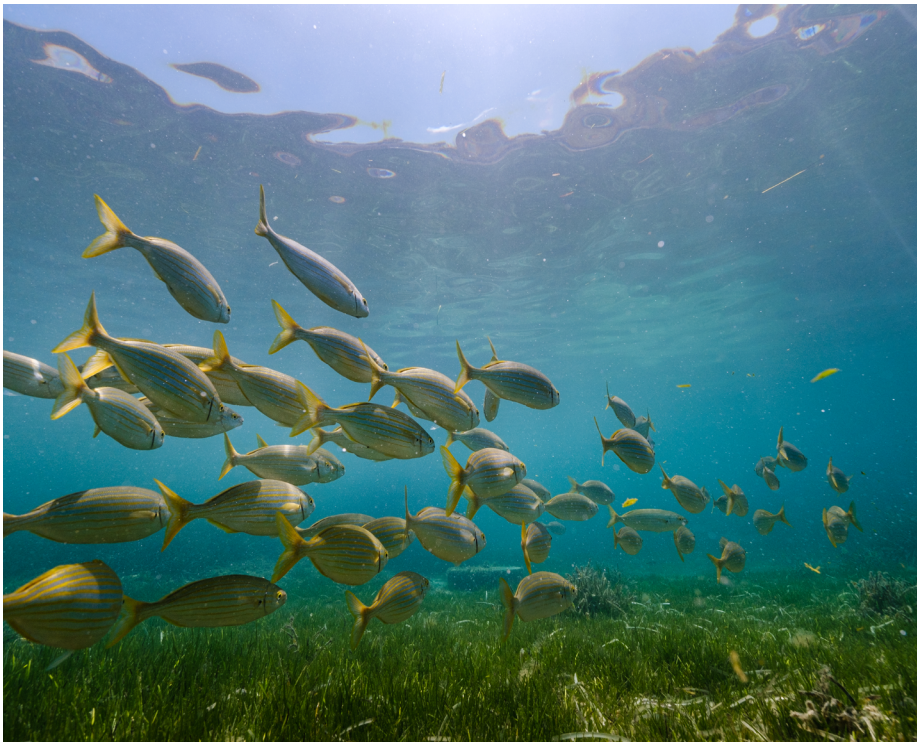
Optimizing Aquaculture with Gurobi

Torgnes had previously used Gurobi while working toward his master's degree, and he recalls its superior performance even then, especially when it came to speed. So, he decided to test with Gurobi and see if it could be the ideal solver for Optimeering Aqua.

“Testing with Gurobi enabled us to verify the performance, and with our new and improved model, we saw huge gains,” he explained. “With the typical problem size, running for half an hour—which was pushing it a little compared to what we were doing before—we were able to get optimal solutions or at least solutions that farmers could not improve upon themselves, which is key.”

And that ability to quickly identify optimal solutions makes a big impact. Torgnes explained, “Even a small optimality gap could mean a difference of $100,000 to $200,000 in weekly value for a farmer.”

“Gurobi is a much faster solver than others on the market,” he added. “You have to think about what fits with your needs and your budget. If performance is what you need, then Gurobi is a great solution, and it's certainly made a key difference for us.”



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