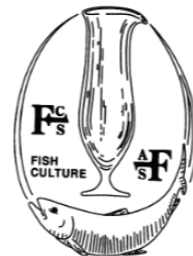


# U.S. Aquaculture: Economic Recovery Through Aquaculture

Conference Summary  
October 1, 2020

## Participating Sponsors



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# Conference Overview

On October 1, 2020, the United States Aquaculture Society (USAS), in partnership with the National Aquaculture Association, American Fisheries Society Fish Culture Section, Catfish Farmers of America, Soy Aquaculture Alliance, and The Nature Conservancy hosted a virtual conference to discuss how U.S. aquaculture can increase economic development in the United States. The webinar was designed to build upon an in-person USAS meeting hosted in Washington, D.C. in the fall of 2019.

Presentations included an update on the U.S. Aquaculture Economic Development Plan, discussion of successful economic development plans from other countries, the impact of COVID-19 on the U.S. aquaculture industry, and the needs of the U.S. aquaculture industry to expand its economic footprint.

# Presentation Summaries

## Status of National Aquaculture Development Plan

**Dr. Jeffrey Silverstein** – Deputy Administrator Animal Production and Protection USDA, Agricultural Research Service

**Mr. David O'Brien** – Deputy Director, Office of Aquaculture, NOAA

**Mr. Andy Jermolowicz** – Director, Business Development Division, USDA Rural Development, Rural Business – Cooperative Service

The panel opened with Dr. Silverstein underscoring the timeliness and importance of discussions surrounding the National Aquaculture Development Plan (NADP), especially given the impact of the COVID-19 pandemic on aquaculture and seafood in particular. As a co-chair of the National Science and Technology Council (NSTC)'s Subcommittee on Aquaculture, a federal agency coordinating group meant to increase the effectiveness and productivity of the federal aquaculture development enterprise, Dr. Silverstein explained the role of the statutory subcommittee as it operates under the Committee on the Environment of the NSTC.

Dr. Silverstein first highlighted actions taken by the federal government to advance the domestic aquaculture sector. Executive Order 13921 (EO 13921), *Promoting American Seafood Competitiveness and Economic Growth*, was signed in May of this year and called on the subcommittee to update the NADP. He stressed that meeting the objectives of the executive order is ongoing, despite impacts from the pandemic. "On many fronts there's more attention on aquaculture than ever before and there's real momentum to make a difference," said Dr. Silverstein. In addition to the work being done by the subcommittee, he noted that Congress is also working to advance U.S. aquaculture with an updated Advancing the Quality and Understanding of American Aquaculture (AQUAA) Act. The bill was reintroduced in September and contains a notable addition in the financial provisions to ease transition into the sector. He stated that by incorporating seafood into national food production, the federal government is recognizing the importance of seafood for food security.

Over the last 18 months, the Subcommittee on Aquaculture has been working on two key elements of the NADP: the Science Planning Task Force and the Regulatory Efficiency Task Force. The Science Planning Task Force includes representatives from the Department of Commerce, Department of Energy, Department of Interior, Department of State, Environmental Protection Agency (EPA), National Science Foundation, and United States Agency for International Development (USAID). The national strategic plan for the Science Planning Task Force contains three goals: 1) to develop economic growth through aquaculture; 2) improve aquaculture production technologies and inform decision making; and 3) uphold animal wellbeing, product safety, and nutritional value. The Regulatory Efficiency Task Force includes representatives from the Department of Interior, EPA, Department of Agriculture, U.S. Army Corp of Engineers, Office of Management and Budget, and Department of Health and Human Services. The strategic plan to increase regulatory efficiency in aquaculture also has three goals: 1) improve efficiency in aquaculture permitting and authorization programs; 2) implement the national approach to aquatic animal health management of aquaculture; and 3) refine and disseminate tools for aquaculture regulatory management.

Each of the task forces developed both strategic plans and implementation plans to address the requirements outlined in EO 13921. In tandem with a third task force, the Economic Development Task Force, these three plans form the foundation for the NADP. Mr. O'Brien and Mr. Jermolowicz are co-chairs of the Economic Development Task Force and presented on the progress made to date in the development of a strategic plan. Mr. O'Brien highlighted some overarching considerations for the plan, including the scope, federal roles, and targets with timelines, and emphasized the larger goal of supporting a robust and resilient domestic aquaculture sector. By design, the plan pre-dated the COVID-19 pandemic and will extend beyond the pandemic, but in order to build a more resilient sector, lessons learned from the pandemic will be taken into account. The strategic plan of the Economic Development Task Force has five goals: 1) incentivize industry investment; 2) support infrastructure and workforce development; 3) expand market opportunities for U.S. aquaculture products; 4) increase public awareness and acceptance; and 5) maximize effectiveness of existing federal programs.

Mr. Jermolowicz explained the details, needs, and challenges of meeting each goal. With the first goal of incentivizing industry investment, he reflected that not only do changes have to be made to the permitting process to reduce barriers to entry, but access to capital is also an issue. Mr. Jermolowicz shared that facilitating access to federal loan programs would help with risk management – how to mitigate risk and what informational resources and tools are available. For example, there are loan guarantee programs that allow for more flexible and longer terms with better interest rates beneficial to both the borrower and lender. Mr. Jermolowicz also provided details on the remaining goals, including training a skilled aquaculture workforce and facilitating public education and outreach to address the health benefits of seafood and sustainability of aquaculture.

In concluding the panel, Mr. O'Brien highlighted two additional overarching pieces of the strategic plan: geographic clustering as a baseline tool for economic development and the USDA's Agriculture Innovation Agenda (AIA), a recently launched program that can be used by the aquaculture community.

# Aquaculture Development Plans From Other Countries

**Mr. Øyvind Enstad Haga** – Director, Innovation Norway

**Dr. Ragnar Tveterås** – Professor & Vice Dean of Research, University of Stavanger Business School  
Dr. Cyr Couturier – Aquaculture Scientist and Chair of Aquaculture Programs, Fisheries and Marine  
Institute of Memorial University of Newfoundland

## Aquaculture Development in Norway

**Mr. Øyvind Enstad Haga** – Director, Innovation Norway

Innovation Norway is a company owned by the Norwegian Ministry of Trade and regional county municipalities that plays a key role in implementing the Norwegian government's business development strategies. Mr. Haga, the director of Innovation Norway, explained that the company offers a range of services including providing expertise, networks, and capital in the form of grants, loans, and guarantees for a variety of sectors, including the aquaculture industry.

Mr. Haga provided a brief history of Norwegian aquaculture development, crediting the country's seafaring, pioneering ancestors for building the foundation of the current modern-day aquaculture industry. He specifically highlighted the importance of sustainability in managing Norway's resources, especially since seafood is the second largest export market behind oil and gas. In regards to aquaculture technology development, the country emphasizes sustainability in developing solutions and business models, with sustainability being a key consideration in assessments for grant and loan applications.

Mr. Haga outlined five pillars that have contributed to the success of the aquaculture industry in Norway, including support from Norway's political parties, research and development (R&D) projects, education, capital and finance, and innovation and cluster development. Wide support for the aquaculture industry across political parties in Norway has contributed to its success. Public and private institutions alike see the value of the industry, and the country has built up a financial system to support research, with the industry contributing a substantial amount of funding through the Norwegian Seafood Research Fund, a fund that takes a percentage of the export value of seafood from Norway for application in larger strategic R&D projects.

Education, from skilled workers to academia, is also important for a successful aquaculture industry. Mr. Haga shared the development of high school and university level fisheries and aquaculture education programs where students not only learn academic skills, but also receive training on practical skills. These programs were formed as an agreement with industry and education authorities and occur on national and regional levels.

The aquaculture industry is capital intensive with a high degree of risk because of greatly varying external factors. Mr. Haga explained that a capital system with knowledge about the industry and the risk factors is a key component to growth and development of the industry. He stated that while private capital is a prerequisite and a backbone in access to capital from ocean-related industries, ultimately it is not enough to leverage growth. He underscored the importance of public funding to minimize some of the personal risk in innovation and build confidence in research and development.

Mr. Haga concluded his presentation with an anecdote that despite all of Norway's knowledge and success in the salmon aquaculture industry, the country still failed in its efforts to develop cod farming. He emphasized that even with a wealth of knowledge, building a new aquaculture production industry is demanding despite good competence, plans, and strategies.

## Policies and Regulation for Sustainable Aquaculture Growth in Norway

**Dr. Ragnar Tveterås** – Professor & Vice Dean of Research, University of Stavanger Business School

Dr. Tveterås provided detailed insight into the policies and regulations behind the salmon aquaculture sector in Norway. He began his presentation by explaining that the profitability margins in salmon aquaculture are volatile, but still higher than other sectors, that usually leads to the entry of new production capacity, but the country is not experiencing such new entry. Despite Norway's past success with the salmon industry, he believes the government is struggling to keep up with new opportunities and challenges created by technological innovation because existing regulations do not give the industry sufficient license to grow.

In Norway, salmon aquaculture is restricted by environmental emissions and biosecurity concerns, such as sea lice, salmon diseases, escapees, and organic emissions. Salmon farms are a potential source for several of these negative externalities, providing the rationale for government regulation. These negative externalities can be within the industry and travel between farms or affect other sectors, like wild-caught fisheries. These externalities increase production costs and mortality for salmon aquaculture because typically, as biomass increases, it increases disease pressure, which in turn negatively affects production.

Dr. Tveterås explained some of the current regulations for inshore salmon aquaculture, that are like a traffic light system, which is aimed at limiting the sea lice induced mortality rate for wild salmonids. The system divides the Norwegian coast into 13 production areas which are colored green, yellow and red depending on the perceived risk of sea lice-induced mortality on wild salmonids. The maximum allowable biomass (MAB) of salmon in each area is then adjusted upwards (green), remains the same (yellow), or reduced (red).

Dr. Tveterås posed the question: how do we expand salmon aquaculture production in a sustainable manner for the future? He explained that sustainable growth in salmon aquaculture depends on new technology and innovation, like offshore production or sea-based closed/semi-closed aquaculture, which would allow salmon farms to grow the same amount of fish biomass, but reduces disease pressure and therefore result in higher production. While these alternative technologies are at a higher price point, they are still competitive, which emphasizes why he believes a change in government policies is key to sustainable growth.

The roadmap for offshore aquaculture is currently being developed and it will depend on sustainability, while also accounting for possible failure. Dr. Tveterås outlined the need for a new regime in Norway that differentiates between the varying systems of open cage vs. closed/semi closed, and land vs offshore. He also emphasized the need for flexible research and innovation policies that are also needed to mitigate market failures.



## Canada's Seafood Farming Development: Getting Back to Growth

**Dr. Cyr Couturier** – Aquaculture Scientist and Chair of Aquaculture Programs, Fisheries and Marine Institute of Memorial University of Newfoundland

Dr. Couturier presented the history of Canadian aquaculture development and outlined the future direction of the industry with an emphasis on growth. In Canada, aquaculture production consists mostly of salmon and some shellfish, with finfish being 64% of the production by weight in 2018. He shared that Canada used to be global leaders in aquaculture production in the 1980s and 90s, but production has since plateaued from 2002 to 2018. The country is now 4th on the global stage behind Norway, Chile, and the UK. Dr. Couturier was optimistic in Canada's capacity for expansion and explained the steps needed in the sector to ensure growth.

Expanding Canada's aquaculture production could result in potential total economic benefits in the range of 5.3 billion Canadian dollars. Dr. Couturier explained that most, if not all, Canadian seafood farmers are integrated into the value chain from egg to plate. The main constraints for growth are a complicated set of regulations across municipal, provincial, and federal levels that restrict growth and limit investment.

Currently, Canada is looking at a blue economy strategy with specific sustainable growth targets of doubling the value of Canadian seafood, doubling the economic benefits, and doubling domestic consumption of fish and seafood by 2040. Dr. Couturier outlined a five-step framework for sustainable growth: 1) name a federal champion for aquaculture and say yes to sustainable growth; 2) develop a sustainable plan; 3) establish an aquaculture act; 4) achieve competitive access to fish health and innovative feed products; and 5) modernize the Canadian shellfish sanitation program. As part of the sustainable development plan, Dr. Couturier also highlighted an important aspect – indigenous reconciliation. The Canadian aquaculture industry is very involved with indigenous reconciliation with over 250 indigenous communities engaged with seafood farming across Canada and significant ownership and partnerships in the provinces. He also highlighted innovation in key areas that would support sustainability and future growth, like closed/semi-closed containment at sea and land, alternative feed ingredients, cleaner fish parasite control, artificial intelligence for fish health, and climate adaptation strategies for fin and shellfish, just to name a few.

Dr. Couturier closed by stating the future of Canadian aquaculture depends on renewed federal and provincial engagement on regulatory reform; support for innovation, research, and development; and participation in the blue economy strategy. Sustainable food production is important to Canadians and seafood farmers make a major contribution to food security of the country.

# Impacts of COVID-19 Pandemic on the U.S. Aquaculture Industry

**Dr. Jonathan van Senten** – Virginia Polytechnic Institute and State University

The impacts of COVID-19 on the U.S. aquaculture industry are far-reaching and not yet fully known. As a response to anecdotes of lost sales and production challenges, a collaborative effort between the Virginia Tech Seafood Agricultural Research and Extension Center (AREC) and The Ohio State University Extension was established to capture and quantify the effects of the coronavirus pandemic on the U.S. aquaculture industry through an online quarterly survey. Respondents to both quarters of the survey covered the extent of the U.S. industry, representing different species groups (catfish, trout, oysters, clams, etc.), target markets (food, recreation, ornamental, etc.), and the United States Department of Agriculture (USDA)-defined aquaculture regions (Southern aquaculture region, Northeast aquaculture region, etc.).

Dr. van Senten presented findings from the first two quarterly surveys and highlighted three major themes that emerged as common issues. The major impacts and effects as a result of the global pandemic are lost sales, labor challenges, and production challenges. For this webinar presentation, Dr. van Senten focused on the average results across all segments, however he emphasized the important nuances between sectors and recommended looking at data from a disaggregated level.

Lost sales and cancelled contracts were primarily the result of disrupted traditional marketing channels due to closures of restaurants and food service establishments. In the first quarter (Q1), more than three-fourths of respondents (84%) reported lost sales and canceled contracts or orders in both domestic and international export markets. Results from the second quarter (Q2) survey indicated that respondents were still experiencing lost sales with 74% of respondents reporting lost sales. Disruption at seafood processors, due to fears of COVID-19 outbreaks, also likely played a role in reduced farm sales. In response to the challenges presented by lost sales, the Q2 survey asked about implementing new marketing channels and trying to adapt. Over a third of the respondents said they had developed or were in the process of developing these new channels, which includes switching to online sales, curbside pick up, and home delivery.

Labor challenges were driven primarily by the loss of revenue from marketing channel disruptions. A third (33%) of Q1 respondents and a little over a quarter (27%) of Q2 respondents indicated that their business had already laid off employees. The majority of respondents indicated that this affected between 1 to 3 employees, but there were instances reported where over 100 positions within a business had been terminated. In addition to terminations and temporary loss of employees, respondents also reported salary cuts for owners and management positions. Several respondents raised concerns about the loss of specialized and skilled labor, describing an inability to manage production or processing activities because of a reduced labor force. Respondents also expressed concern about the health and wellbeing of their employees; noting efforts to implement revised protocols to allow for social distancing and purchasing of additional COVID-19 related personal protective equipment.

The third theme that arose from the surveys were challenges experienced in production. In addition to challenges in obtaining production inputs, like feed or seed, or repair and maintenance for equipment and infrastructure, producers noted that holding inventory of market-ready products would interfere with their ability to start production of future crops. This suggested that disruptions caused by the COVID-19 pandemic may result in a supply shortage of U.S. aquaculture products beyond 2020, as some crops take multiple years to reach market size.

During the Q1 survey, a series of programs intended to provide relief and support to agricultural sectors were announced, so questions about those programs were incorporated into the Q2 survey. Respondents indicated that federal and/or state assistance helped their businesses survive, and 90% of the respondents that applied for the Paycheck Protection Program, received it. Over 50% of the respondents that applied for programs did receive some sort of assistance and only a small percentage had been declined.

Dr. van Senten closed by reiterating that the study is still ongoing, with the start of the third quarter (Q3) survey on October 5, 2020. The surveys so far have displayed a variety of specific challenges and impacts resulting from the pandemic. The cascading effects of market channel disruptions and the resulting loss of revenues, are likely to present the U.S. aquaculture industry with continued challenges for the duration of 2020.

# U.S. Aquaculture: Opportunities and Conditions for Continued Growth

**Mr. Jim Parsons** – President, National Aquaculture Association & General Manager, Cooke Aquaculture Pacific

The National Aquaculture Association (NAA) serves as a national voice for aquaculture producers in the United States with a mission to ensure aquaculture sustainability, protect profitability, and encourage development in an environmentally responsible manner. Mr. Parsons, the current president of the NAA, provided some industry responses to the events of 2020, his view on the state of U.S. aquaculture, and conditions for continued growth of the industry.

In response to the COVID-19 pandemic and the current state of the aquaculture industry, Mr. Parsons provided an optimistic view with an emphasis on the history of resiliency in aquaculture. He highlighted the steady progress of aquaculture growth in the U.S. before the pandemic and provided anecdotes of strong sales in sportfishing and ornamental fish during the pandemic. He also applauded the ongoing efforts in establishing a National Aquaculture Development Plan. Mr. Parsons spoke about the importance of a sustainability focus in the aquaculture industry, and how this highlights the health of the U.S. aquaculture industry. He listed a variety of third-party certification programs, which include components of ensuring compliance with laws, animal welfare, environmental care, and more, that have been developed in the last decade that are becoming a regular business practice which ensure the future success of the industry.

In May 2020, the federal government adopted EO 13921, designed to promote U.S. seafood competitiveness and economic growth. Mr. Parsons discussed how the conditions outlined in EO 13921 could improve aquaculture farming efforts and encourage growth in the sector. He stated that one of the biggest barriers to industry growth has been the sheer number of regulatory authorities involved, from state to federal, which a goal of EO 13921 is to clarify regulatory authorities and direct the agencies to align their regulatory processes. The executive order also established a Seafood Trade Task Force to examine seafood trade strategies through improved access to foreign markets, resolving technical barriers to U.S. exports, and supporting fair market access to U.S. seafood products.

The development of the Comprehensive Aquaculture Health Program Standards (CAHPS), with the USDA's Animal and Plant Health Inspection Service (APHIS), was another important step for the growth of the aquaculture industry. These standards will not only ensure the health of farmed aquatic animals, but also allow for safe interstate and international trade of those aquatic animals. The executive order also called for the identification of geographic areas suitable for commercial aquaculture and completing environmental impact statements for those areas. Mr. Parsons emphasized the need for science-based steps forward and called for collaboration between agencies and aquaculture organizations to ensure the development of marine farms in the U.S. beyond a level of demonstration.

For the aquaculture industry in the U.S. to expand enough to meet the country's demand for seafood, Mr. Parsons asserted there must be economic assurances for companies willing to invest in the effort. The system must boost investor confidence by ensuring certainty in regulatory stability, increasing available capital, incentivizing investment, managing risk, supporting industry recruitment, and improving technology. Mr. Parsons concluded by saying,

"While there is not a clear path to continued growth of the U.S. aquaculture sector, fish farmers have been finding a way forward to innovate and grow, literally, for centuries. By continued education of the American consumer and implementation of some of the action items that we talked about today, our opportunities to make a direct difference in the health, food security, nutritional being, and quality of life of our citizens can be realized."

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