Marine Aquaculture
Finding Room to Grow

Reaching Our Potential

Offshore aquaculture, farming beyond the nearshore and inshore coastal zone, in waters greater than 65 feet in depth, is the most promising option for expanded sustainable seafood production, but this potential is largely untapped.

Studies have shown that, with vast expanses of favorable growing areas with suitable depths, current speeds, temperatures, and access to ports and coastal infrastructure, the U.S. can play a significant role in meeting the growing demand, with strong environmental safeguards, while lowering our carbon footprint.

Recent estimates suggest that the U.S. could meet its entire current seafood demand with domestic production if finfish aquaculture were developed in about 0.01% of the U.S. Exclusive Economic Zone.

Advances in Technology

Traditionally, aquaculture in the U.S. has taken place at the land-sea interface—in intertidal areas, estuaries, and sheltered bays. While calm waters and easy access make nearshore seafood farming attractive, some environmental impacts and conflicts with other uses are accentuated in the increasingly crowded coastal zone. Advances in technology and culture methods have made it possible to establish farms further from shore and in rougher open-ocean conditions, opening up new expanses to potential aquaculture farming.

Blue Ocean Mariculture is sustainably growing Hawaiian Kampachi in submersible sea pens located off the Big Island of Hawaii near Kona in state waters. Production begins in the onshore hatchery with fertilized eggs from brood fish. The premium, sashimi-grade fish is sought after by Hawaii's top chefs and fine dining restaurants throughout the U.S.

Location, Location, Location!

Smart spatial planning can minimize environmental impacts, while modern tools including electrochemical analysis, image analysis, and sophisticated modelling informs siting. Water quality and benthic impacts can be minimized by considering water depth, flushing rates/current velocity, temperature, and biological activity in the water column and bottom sediments when siting an aquaculture farm. Proper siting can also limit the potential for escaped fish to interact with wild populations, minimize risks of diseases spreading to wild populations, decrease entanglement with marine mammals and other wildlife, and reduce conflicts with other commercial and recreational uses. Selecting an appropriate location, coupled with best management practices, appropriate regulation, and monitoring, can allow for environmentally sound marine aquaculture.

NOAA has selected southern California and the Gulf of Mexico as the first 2 regions in federal waters to be designated as Aquaculture Opportunity Areas, areas with the potential to host sustainable commercial aquaculture. Specific locations will be identified based on best-available science, including data-driven siting analyses.

Research shows southern California offers prime ocean conditions, good port infrastructure, and large demand for fresh seafood, with high levels of potential seafood production and revenue from very modest levels of aquaculture development. Similar evaluations can be conducted in other areas with existing scientific expertise and data.

Need for a Clear and Predictable Legal and Regulatory Framework

In spite of advancing technology and available space, the U.S. has very limited commercial offshore aquaculture development, with farms located almost exclusively in state waters.

The U.S. aquaculture regulation and permitting system is highly fragmented across multiple state and federal agencies and jurisdictions. The lack of a strong and streamlined policy framework causes regulatory uncertainty that deters potential developers. At the federal level, there is no clear roadmap for the permitting and leasing process for offshore aquaculture, resulting in a lengthy and expensive procedure that's rife with uncertainty.

A clear and predictable legal and regulatory structure is needed to advance responsible U.S. marine aquaculture and unlock its potential to increase the resilience of the global food system, mitigate climate impacts, feed a growing population, and serve as a new source of economic development.

As the global population increases and becomes wealthier, demand for animal protein and seafood is increasing dramatically. The question is not if the world will need and demand more seafood, but how and where that seafood gets produced.

Offshore Aquaculture in China

Mariculture is the fastest-growing primary industry in Australia and comprises 43% of the nation's seafood production by value. Over 40 species are commercially produced in Australia, including high value species such as pearls, salmonids, tuna, and oysters.

Australia has an international reputation as a producer of safe, sustainable, and high quality seafood products thanks to its rational and efficient permitting and regulatory environment. In addition, the establishment of aquaculture zones has streamlined development while minimizing the impacts of aquaculture on the marine environment and existing ocean users.

Mitigating Climate Impacts

While not immune to the impacts of climate change, aquaculture offers unique opportunities for adapting to and mitigating its effects. Species can be selected or selectively bred for farming that are optimal for local growing conditions and resilient to increases in temperature and other changing environmental conditions. Through aquaculture hatchery and nursery practices, young shellfish, finfish, and seaweeds are nurtured through their most vulnerable juvenile life stages before being planted onto farms for grow-out. These practices can include buffering of acidic intake seawater into hatcheries or use of innovative technologies such as probiotics to boost survival of young shellfish. Siting aquaculture systems in locations with optimal conditions, as well as the ability to position systems throughout the water column, allows them to resist marine heatwaves that force wild fish to migrate and would harm less mobile species.

AMERICAN FISHERIES SOCIETY

Contact: Drue Winters, Policy Director
dwinters@fisheries.org