

WRAC fact sheet

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Characterization of Aquaculture in the Western U.S.

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OYSTER FARMING

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Photo: Pacific oyster clusters on longlines, north Hood Canal, WA.

Oysters were the second-leading aquaculture crop (by sales) produced in the U.S. according to the 2018 Census (Figure 1). Oyster farming has increased substantially over time, with increases in sales (Figure 2a) and number of farms (Figure 2b). Different species of oysters are raised across the U.S., with the greatest percentage of oyster sales nationally consisting of the Eastern oyster (*Crassostrea virginica*) (47%), followed by Pacific oysters (*Crassostrea gigas*) (31%), and other oyster species (22%) (Figure 3). Virginia led the nation in oyster sales in 2018, and was followed closely in descending order by Washington, then Louisiana, California, Massachusetts, and Oregon (Figure 4).

In the Western Region, oyster sales exhibited the same increasing trend (Figure 5a) as that of the nation. The number of oyster farms in the Western Region, however, declined by approximately 28% from 2005 to 2013 and another 5% from 2013 to 2018. The principal oyster species raised in the Western Region is the Pacific Oyster, but Kumamoto oysters (*Magallana sikamea*) have become increasingly important in raw oyster markets

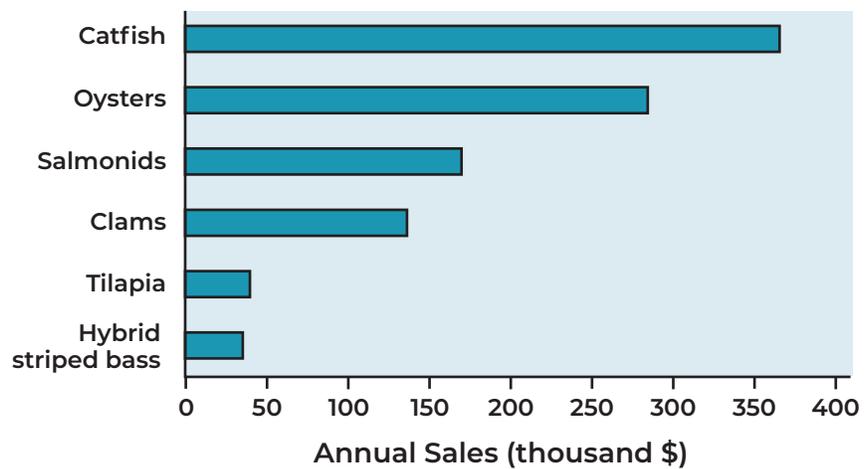
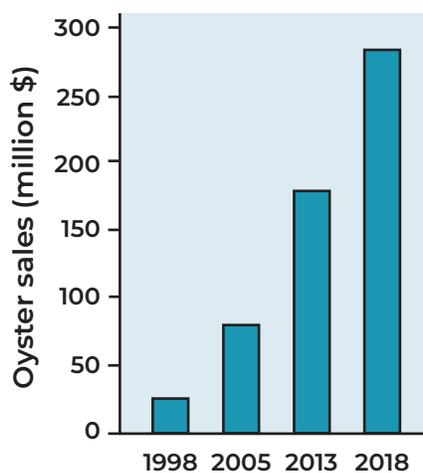


Figure 1. U.S. Aquaculture sales (2018) by species group.

Source: USDA-NASS (2019)

a) Oyster sales, 1998–2018



b) Number of oyster farms

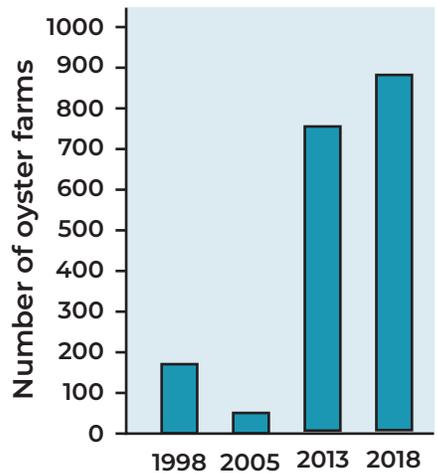


Figure 2. Trends in oyster farms in the U.S.: a) by sales; and b) number of farms. Source: USDA-NASS (2000, 2006, 2014, 2019)

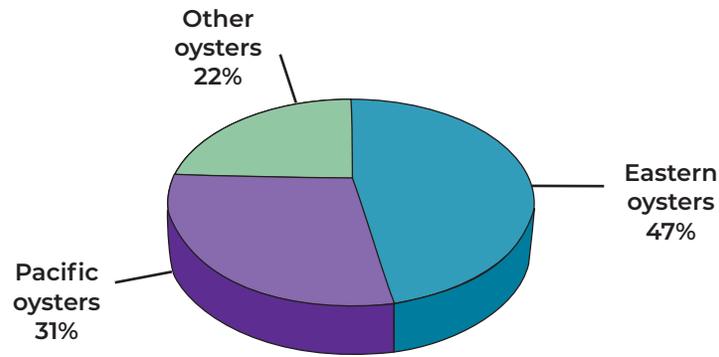


Figure 3. Major types of oysters raised in the U.S. (2018) by sales. Source: USDA-NASS (2019)

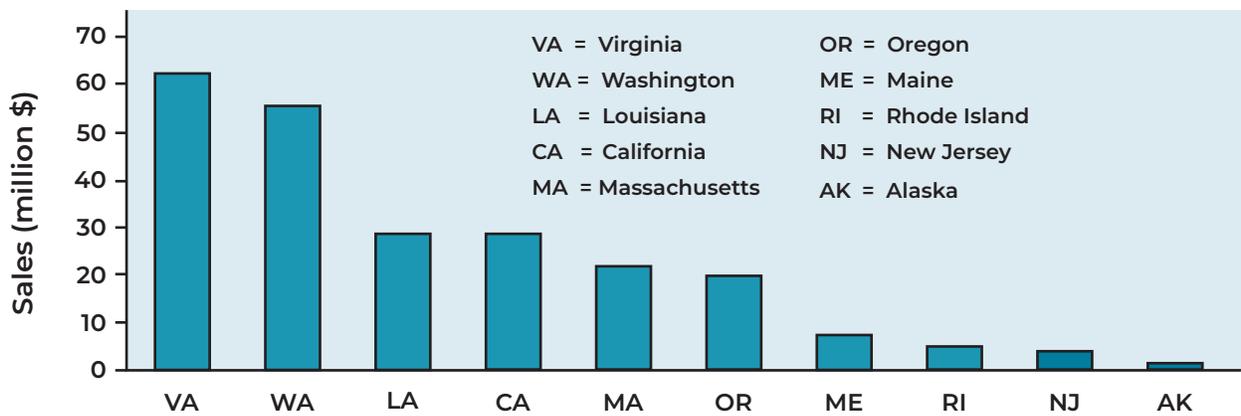
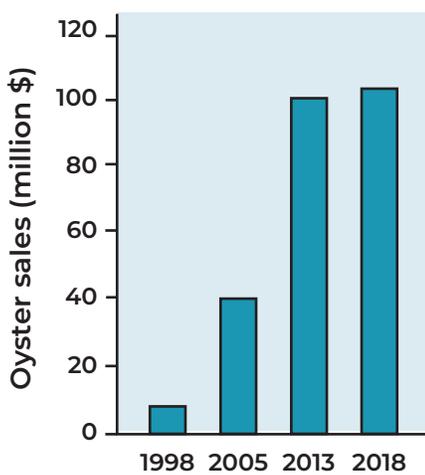


Figure 4. Top 10 oyster-producing states by sales (million \$). Source: USDA-NASS (2019)

a) Oyster sales, 1998–2018



b) Number of oyster farms

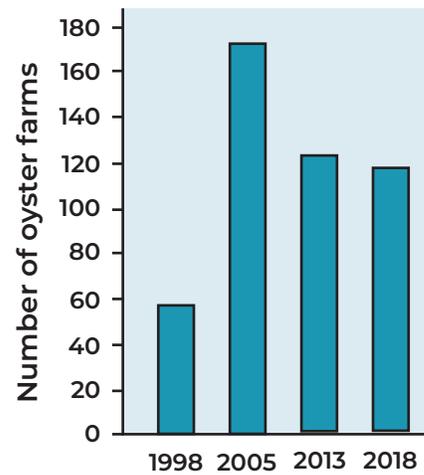


Figure 5. Trends in oyster farms in the Western Region: a) by sales, and b) number of farms. Source: USDA-NASS (2000, 2006, 2014, 2019)

(Engle and van Senten, 2024 a, b, c). Olympia oysters (*Ostrea lurida*), native to the Western Region, continue to be raised and sold, along with smaller volumes of Eastern and European (*Ostrea edulis*) oysters.

Oyster farmers in the Western Region have developed and supported distinct supply chains. A generalized supply chain map for oysters in the Western Region is illustrated in Figure 6. Oyster supply chains begin with the various upstream businesses that supply inputs to oyster farms. One of the key inputs is seed produced by oyster hatcheries, which is planted by oyster growout farms. While some oyster farms have integrated hatcheries into their growout businesses, other oyster farmers in the region purchase seed from a separate oyster hatchery. Historically, most oyster seed planted in the Western Region was supplied by hatcheries in the region, but increased ocean acidification affected supply to the extent that several Western Region oyster farms developed new hatcheries in Hawaii.

Oyster supply chains include



Photo: Bobbi Hudson, Pacific Shellfish Institute

Pacific oyster clusters on longlines, north Hood Canal, WA.

companies that manufacture the various types of gear used in oyster farming. Innovations by these upstream companies have resulted in a wide variety of baskets, bags, and cages now used to raise oysters. In addition to the more traditional on-bottom growout methods, there have been substantial increases in

container methods for floating and suspended oyster culture. Oysters raised in cages frequently are sold to the half-shell market, which has grown dramatically to supply increasing numbers of oyster bars in coastal areas. Further innovations in oyster farming have included development of equipment for tumbling

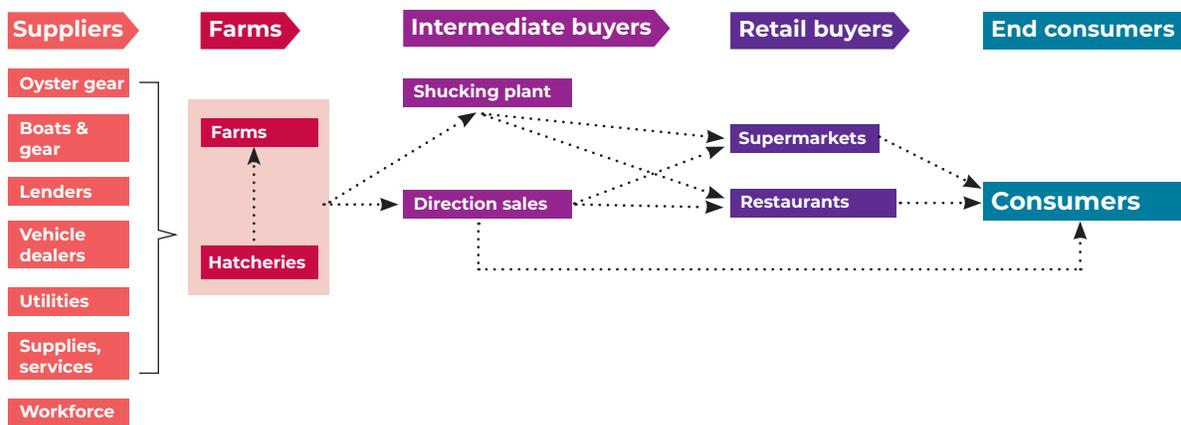


Figure 6. Generalized supply chain for oysters raised in the Western Region.



Photos: Bobbi Hudson, Pacific Shellfish Institute.

Left: An oyster raft in southeast Alaska; Center: Aqua-Pacific wire mesh cases hung in stacks of ten below the raft; Right: Sorting oysters on a southcentral Alaska oyster farm with extruded plastic high-flow cages by Thunderbird Plastics.

oysters to produce a deeper cup and improved meat-to-shell ratio that is attractive to many consumers.

Other upstream partners in oyster supply chains include manufacturers of boats and associated gear, such as winches for harvesting; suppliers of other inputs, such as waders and other gear for employees; lenders; and utilities that provide electricity; and communication services. The workforce labor inputs that account for 33% to 68% of the total production cost of oysters are equally critical to oyster farm supply chains. (Braden, 2020; Parker et al., 2020; Petrolia et al., 2020; Engle et al., 2021, 2023).

The two major market channels for oysters are sales to shucking plants and sales of individual oysters for the half-shell market. Shucking plants primarily purchase oysters raised on the bottom that often grow in clumps. In the plant, oysters are shucked to remove meat from the shell for sale to supermarkets and restaurants. Oysters sold for the half-shell market are cultured individually in various containers and frequently

are tumbled to produce distinctive shapes. Farmers have developed their oysters into differentiated, branded products with names that reflect either the water body where grown, the distinctive shape produced by tumbling, or simply a fanciful name that attracts consumer attention. Oyster bars, restaurants, and supermarkets are the primary buyers of oysters on the half shell. Some vertically integrated oyster farms have developed their own restaurant and oyster bar concepts. Other oyster farmers sell to wholesalers, who may also be distributors, or they sell directly to consumers through online sales, supermarkets, and restaurants.

The growth of oyster farming in the Western Region has been constrained by various permitting issues, particularly those of the U.S. Army Corps of Engineers (van Senten et al., 2020). The major permitting issue with West Coast shellfish farms has been the extensive delays in permitting that result from sequential rather than concurrent approval processes across agencies as well as chang-

ing requirements throughout the process. The regulatory compliance burden on Western Region shellfish farms generally was estimated to account for 29% of total costs of production. Of greater concern is that lost revenue from markets due to regulatory action or trade barriers and lost opportunities due to regulatory barriers to expansion and diversification were found to be \$280 million/year across the region, suggesting that shellfish farming in the Western Region could be several times greater than its current size.

Summary

Oyster farms in the Western Region have created jobs in hatcheries, on farms, and in shucking plants as well as in the many businesses that participate upstream and downstream in the oyster supply chain. Identifying more efficient ways to provide adequate oversight of oyster farming, but without the extended delays in permitting, would allow the industry to more fully meet demand for oysters across the U.S.

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