

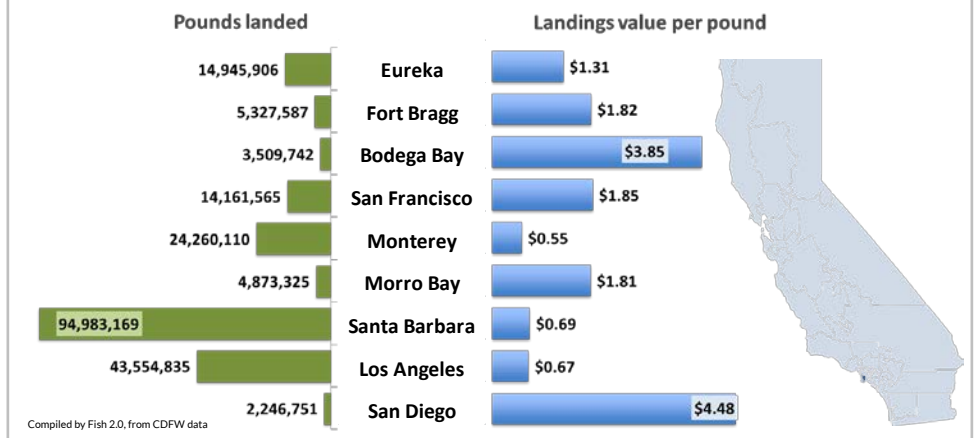
**California produces only 4% of total U.S. seafood, but is a unique market with plenty of growth potential.** In 2017, California's wild fisheries landed 208 million pounds of seafood worth \$196 million,<sup>1</sup> just over the value of farmed seafood produced (\$175 million) in the state in 2016.<sup>2</sup> Key wild species include high-volume fisheries such as market squid, Dungeness crab, sardine, and mackerel. Alongside these, California lands some of the most expensive species in the world—spiny lobster and sablefish—which gain the best prices when exported to Asia.

**With its 840 miles of coastline, latitudinal diversity, and nutrient-rich cold waters, California has the ecological potential to be a premier seafood producer.** It also has some of the strictest environmental protections in the world, which cap and restrict its wild fisheries and which can create significant permitting challenges for aquaculture operators. However, these environmental protections have led to the recovery of several local wild species (e.g., rockfish), and they serve as an impetus for development of innovative, low-impact aquaculture projects. They also give California seafood a reputation for great quality and sustainability worth paying more for.

**California's role in the seafood industry is much larger than that of a producer—the state is also an innovation hub for ocean-focused enterprises and technologies.** California is home to several world-class universities that attract and develop top talent who go on to produce leading research in science and technology. The state has 16 marine research laboratories and many more field stations along the entire coast, making California waters very well researched. Meanwhile, Silicon Valley, home to countless tech start-ups and investors, delivers a constant stream of technology innovation that has direct and indirect applications in the seafood industry.

**California is also a consumer market not to be ignored.** With 40 million inhabitants and higher-than-average per-capita seafood consumption, California is the single largest market in the U.S., worth \$3 billion.<sup>3</sup> Californians are thought to eat more seafood for three reasons: 1) more than half of all residents live near the coast; 2) the state boasts great ethnic and culinary diversity (27% of Californians are foreign-born), with large, seafood-loving Hispanic and Asian-American populations; and 3) Californians are comparatively health-conscious and trendsetting eaters who appreciate the nutritional benefits of seafood.

## California Commercial Fishing Landings – 2017



## Opportunities and Innovation Areas

### Aquaculture – growing cautiously

Oysters, mussels, and abalone have been farmed in California for decades and are the state's main aquaculture products. Recently, after years of debate and analysis, a new (ostensibly low-impact) oyster/mussel/kelp farm has received a permit for an offshore operation, which paves the way for more such scalable projects in California. A new offshore finfish (yellowtail) project is under review—if granted, it will be the largest U.S. offshore farm and could push the frontiers of aquaculture in the Golden State.

### Wild fisheries – market potential constrained by infrastructure

California has the oceanographic conditions, market proximity, and scientific expertise needed for economically strong and environmentally responsible fisheries. New marketing efforts are being launched to drive awareness, market differentiation, and availability of sustainable seafood such as rockfish, lingcod, and sablefish. There are a number of noteworthy direct-to-consumer ventures that have potential to scale. However, meaningfully expanding and maximizing California's wild fisheries output will require the redevelopment of lost local port infrastructure, supply chains, and processing capacity.

### Seafood meets tech

California's thriving tech industry is becoming increasingly interested in solving ocean and seafood challenges, and is producing investable ventures with potential for global impact—be it in aquaculture feed, seafood traceability solutions, or data capture for management. Moreover, the seafood industry benefits from the innovation spillovers of other Valley endeavours, such as precision agriculture, biotech, sensor and satellite technologies, data sciences, and blockchain and computer vision applications.

### Silicon Valley is veganizing seafood

For some time now, Silicon Valley has been disrupting the animal-products industry with plant-based alternatives—a market that has grown 24% since 2017 and worth \$3.3 billion in the United States in July 2018<sup>4</sup> and almost \$11 billion globally. Now Silicon Valley is using similar technologies and approaches to *veganize* seafood favorites. We see a variety of base materials being used, including pea and heme (Impossible Foods), soy (New Wave Foods), fungi (Terramino Foods), and konjac (Sophie's Kitchen), as well as efforts to culture genetically identical salmon (Wild Type) and bluefin tuna (Finless Foods).

#### Sources:

1. National Marine Fisheries Service, Commercial Fisheries Statistics.
2. California Department of Fish and Wildlife.
3. Ibis World, Fish & Seafood Wholesaling in California – US Market Research Report, September 2017.
4. Plant Based Foods Association.

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