



The Case for Aquaculture

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Oregon and Pacific Northwest Aquaculture
Development Conference
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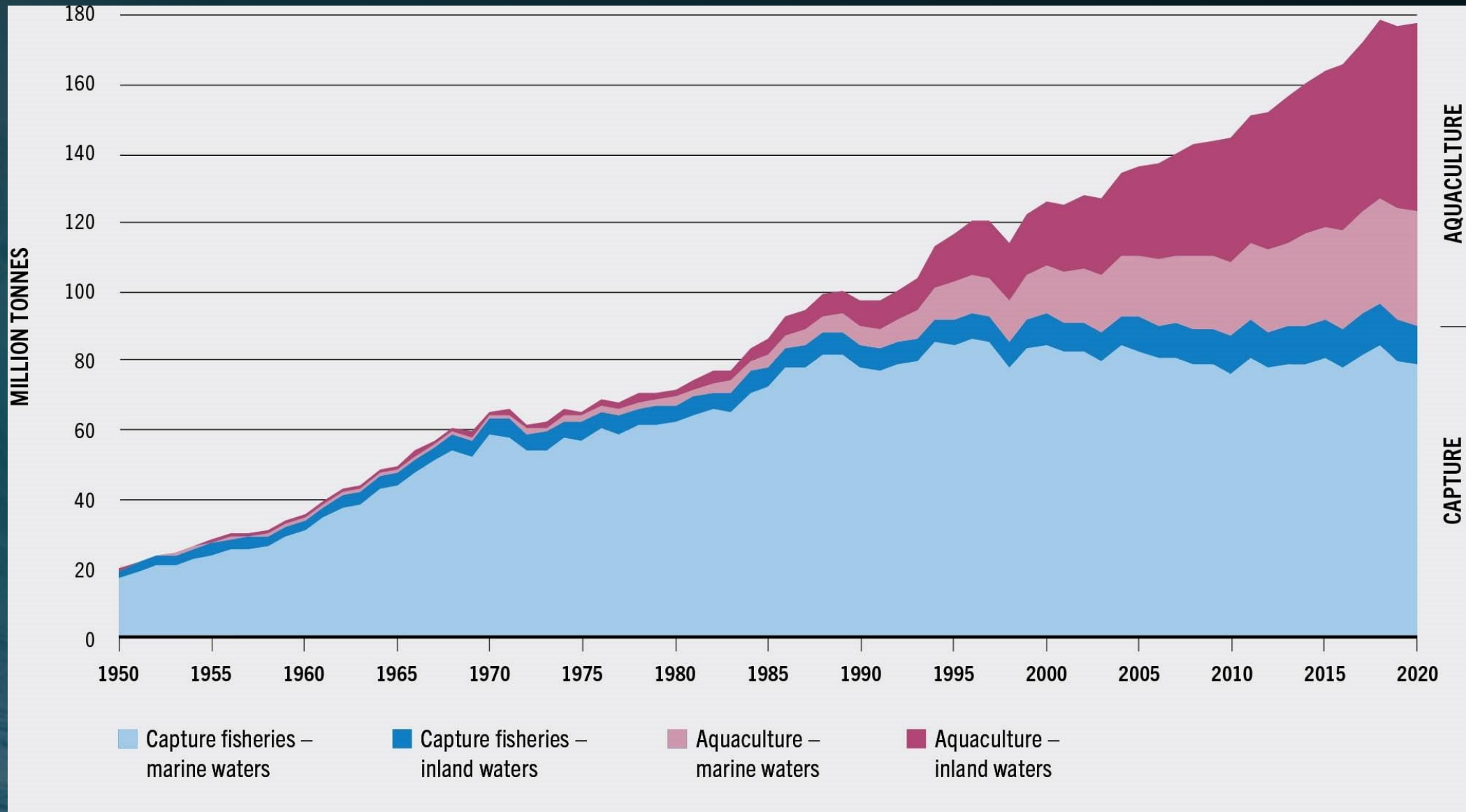
Our Goal



Join the ranks of countries producing fish and shellfish to meet the challenge of 9 billion people by 2050

The Kicker:

- 76% increase in meat production





World Production

- Global production of aquatic animals was estimated at **178 million tonnes** in 2020. Capture fisheries contributed **90 million tonnes (51 percent)** and aquaculture **88 million tonnes (49 percent)**.
- Total production of aquatic animals is expected to reach **202 million tonnes in 2030**, with the main increase coming from aquaculture, contributing **106 million tonnes in 2030**.



US Seafood

- US edible fishery landings 6.7 billion pounds
 - Exported 2.4 billion pounds.
- US imported edible seafood 6.1 billion pounds
- US seafood trade deficit \$17 billion.
- US aquaculture **658 million pounds**
- Per capita consumption 19 pounds.
- Human health recommendation 2 servings per week = 26 lbs.
 - **10% to 20% of Americans achieve this goal.**

Food spending and share of income spent on food across U.S. households, 2020



Source: USDA, Economic Research Service using data from the U.S. Bureau of Labor Statistics, Consumer Expenditure Survey, 2020.



Challenges

- Social License
 - Myths
 - NIMBY
- Regulations
 - Complexity
 - Cost



Social Environment

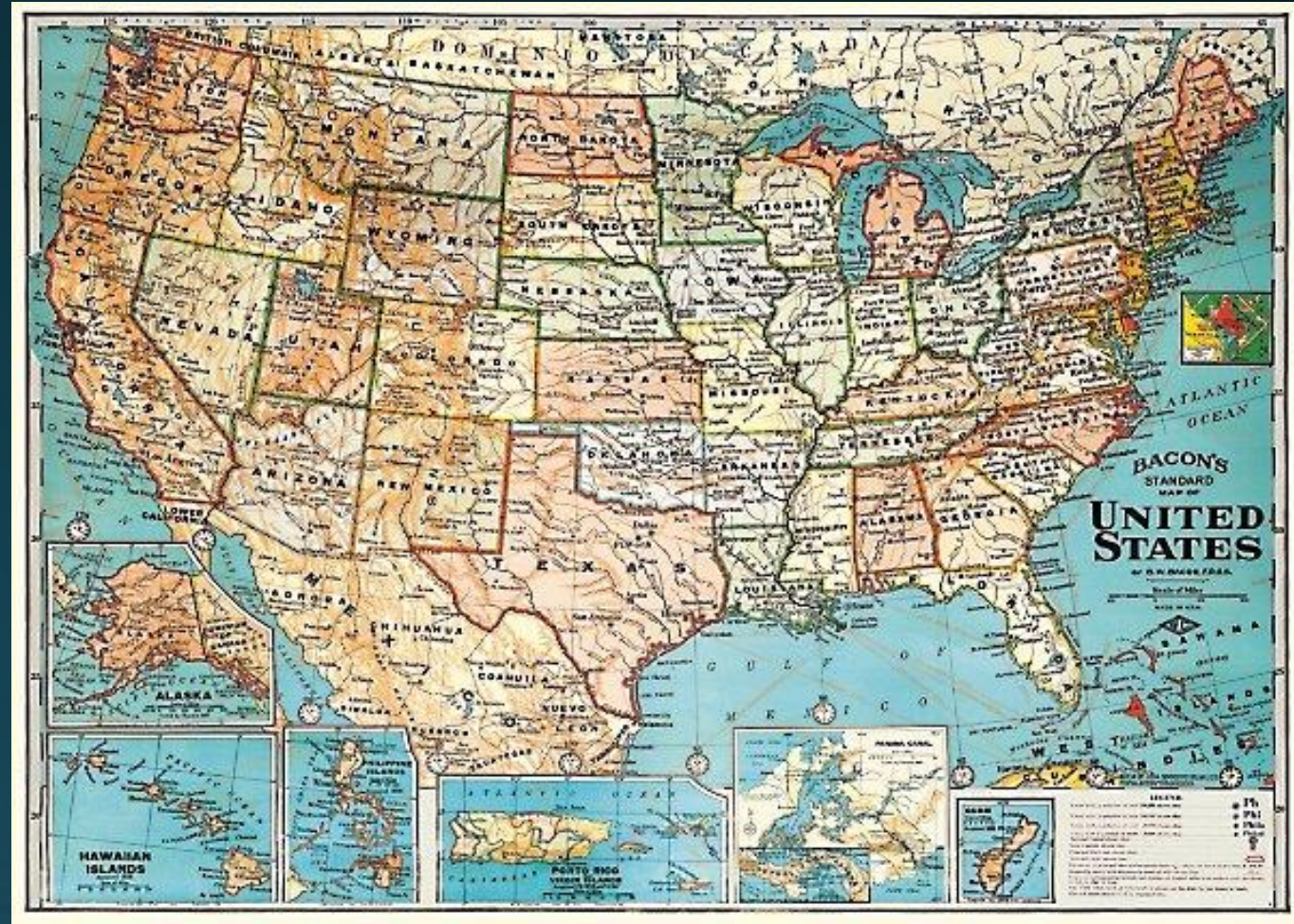


Complexity upon complexity

- A republic composed of 50 sovereign states.
- U.S. Constitution, Article 1, Section 8, Clause 3
- It takes an Act of Congress...
- ...interpreted via the Code of Federal Regulations...
- ...and enforced by host of many minions.



A Republic





The Commerce Clause

“To regulate commerce with foreign nations, and among the several states, and with the Indian tribes”

Federal Food Drug and Cosmetic Act

Clean Air Act

Clean Water Act

An Act of Congress: 20 (so far)

Animal Health Protection Act; Animal Medicinal Use Drug Clarification Act; Coastal Zone Management Act; Endangered Species Act; Federal Food Drug and Cosmetic Act; Federal Insecticide, Fungicide, and Rodenticide Act; Fish and Wildlife Coordination Act; Federal Water Pollution Control Act (Clean Water Act); Food Safety Modernization Act; Lacey Act; Magnuson-Stevens Fishery Conservation and Management Act; Marine Mammal Protection Act; Migratory Bird Protection Act; National Environmental Policy Act; National Historic Preservation Act; National Marine Sanctuary Act; National Invasive Species Act; Non-indigenous Aquatic Nuisance Prevention and Control Act; Outer Continental Shelf Lands Act; and Rivers and Harbors Act

Federal Regulatory Agencies: 15 (so far)

Council on Environmental Quality

Dept. of Agriculture : AMS, FSIS, APHIS {ARS, ERS, FSA, NASS, NIFA, RD, RMA}

Dept. of Commerce : NOAA-NMFS {EDA, NCCOS}

Dept. of Defense : ACOE

Dept. of Health and Human Services : FDA (CFSAN, CVM)

Dept. of Homeland Security : CISA, USCG

Dept. of Interior : BOEM, BSEE, FWS

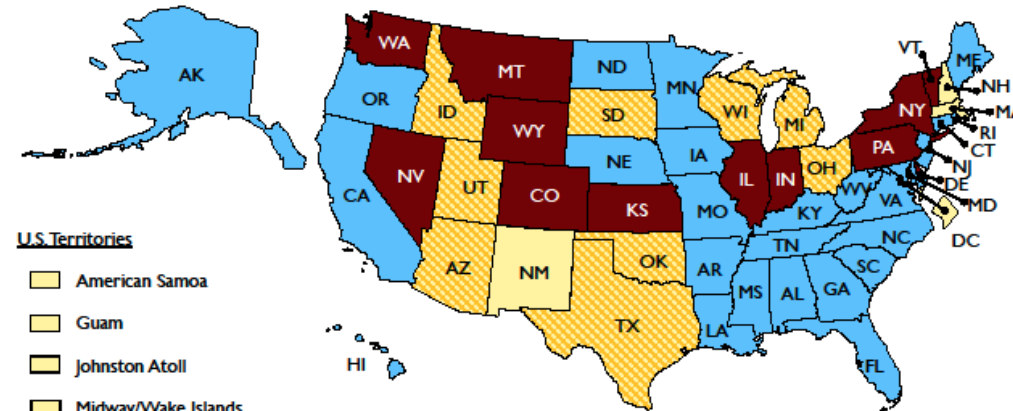
Dept. of Transportation : FAA, FMCSA

Environmental Protection Agency

Delegated, or not, to State Regulatory Agencies

(states can be more restrictive)

NPDES Program Authorizations (as of July 2019)



U.S. Territories

- American Samoa
- Guam
- Johnston Atoll
- Midway/Wake Islands
- Northern Mariana Islands
- Puerto Rico
- Virgin Islands

State NPDES Program Status

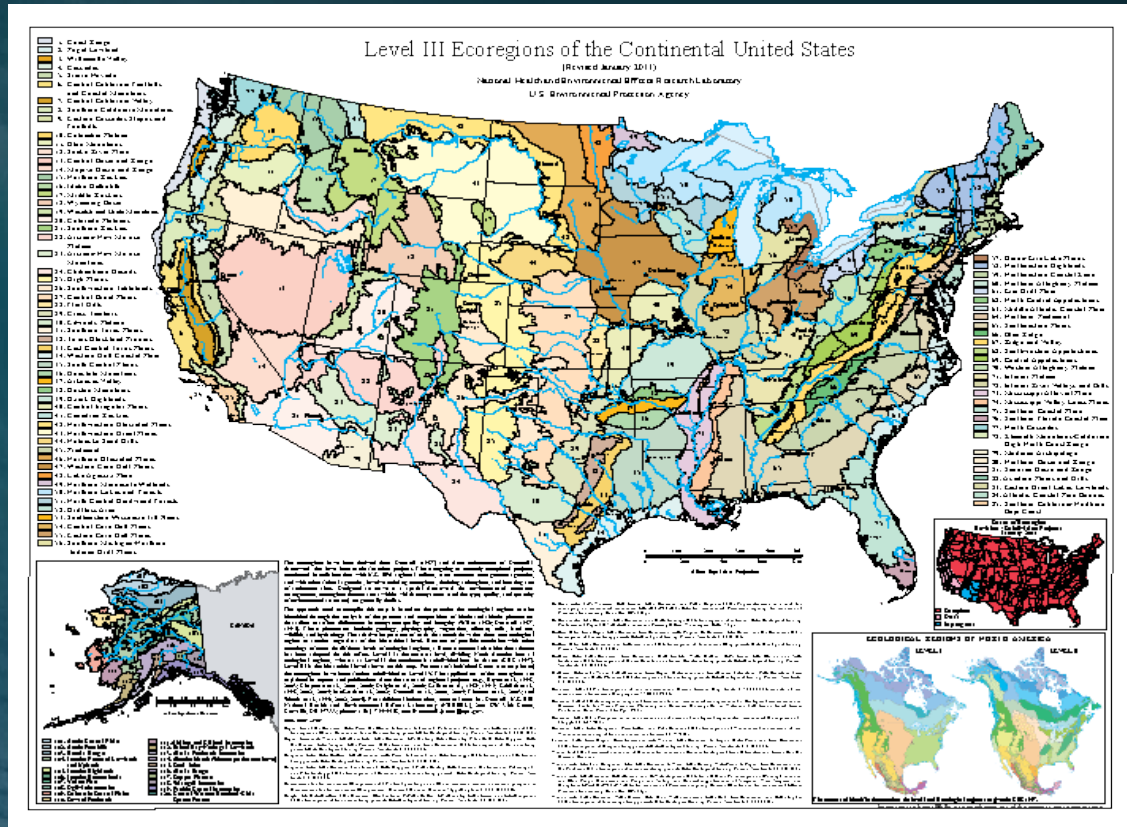
- Fully authorized
- Fully authorized, including an approved biosolids program
- Partially authorized
- Unauthorized



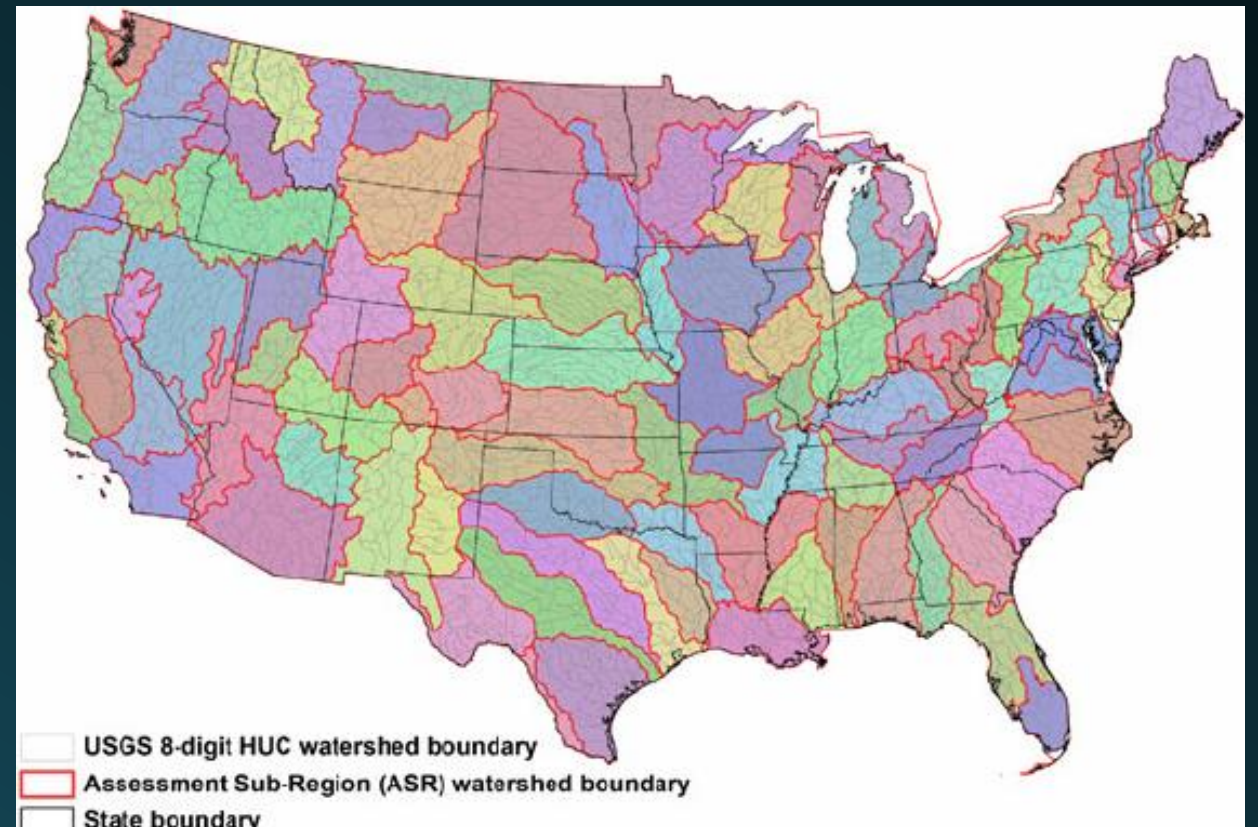
More Complexity

- Land
- Water (environment)
- Species
- Human Health
- Animal Health

Land: Ecoregions



Water: Hydrologic Unit Codes



The background of the slide features a vertical strip on the left side showing a close-up of ocean waves with white foam. The rest of the background is a dark teal color with a subtle, wavy pattern.

Species

United Nations-Food and Agriculture Organization estimated:

- 466 individual aquatic animal species
- 7 interspecific hybrids of finfish

Fish, shellfish, reptiles, and crustaceans:

- 92 species groups at genus level
- 32 species groups at family level
- 25 species groups

Seaweed: kelp (bull, ribbon, skinny, sugar, winged), dulse, nori, Gracilaria spp., Ulva.

Aquatic plants: 600+



Human Health

Food Safety Modernization Act

- States follow federal regulatory changes
- Interstate Shellfish Sanitation Conference

Federal Food Drug and Cosmetic Act

- FDA sets national regulations for therapeutants



Aquatic Animal Health

Federal Food Drug and Cosmetic Act

- FDA sets national regulations for therapeutants

Animal Health Protection Act

- USDA Animal and Plant Health Inspection Service
 - National Aquaculture Health Plan & Standards
 - Comprehensive Aquaculture Health Program & Standards

Lacey Act

- U.S. Fish and Wildlife Service
 - 50 CFR §16.13: Salmonids live or dead uneviscerated, live fertilized eggs, or gametes are prohibited entry except when accompanied by a health certification.

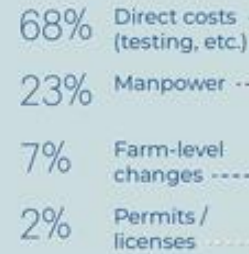
The Effects of Regulations on the U.S. Salmonid Industry

National Findings

Focused on the 17 top-producing states:

Colorado · California · Idaho · Maine · Michigan · Missouri · Nebraska · New York · North Carolina · Ohio · Oregon · Pennsylvania · Utah · Virginia · Washington · West Virginia · Wisconsin

Considered the most problematic regulation by the farmers



Regulations substantially increased on-farm costs and constrained the industry's ability to meet market demand.

REGULATORY COSTS PER YEAR:

National (total) **\$ 16.1 Million**

On-farm (average) **\$ 150,506**

LOST REVENUE PER YEAR:

Thwarted expansion attempts **\$ 40.1 Million**

Lost market sales **\$ 7.1 Million**

Reduced production **\$ 5.3 Million**



Reforms to reduce regulatory costs:

- Reduce regulatory redundancy
- Reduce frequency of effluent testing*
- Reduce frequency of fish health testing*
- Adopt fish health testing standards
- Adopt clear appeal procedures for farmers
- Adopt risk-based approaches to environmental management

*For farms with history of good performance

For more information check the scientific article by Engle et al. (2019) J. World Aquacult. Soc.

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Team Aqua to the Rescue!

- 35+ national, regional, state and species aquaculture associations
- 3,000+ farmers
- Aquaculture suppliers
- 112 Land Grant Universities
- 33 Sea Grant Colleges and Universities
- State and national aquaculture conferences
- White House: Subcommittee on Aquaculture



Subcommittee on Aquaculture

National Aquaculture Development Plan

1. National Economic Development Plan
2. National Strategic Plan for Aquaculture Research
3. Strategic Plan to Enhance Regulatory Efficiency in Aquaculture



WATKERSON



One Strong Voice, One Strong Industry

National Aquaculture Association

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