Regulatory Effects on the Value of Shellfish Aquaculture

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East Coast Commercial Fisherman’s & Aquaculture Trade Exposition
January 19th, 2019
Current state of U.S. aquaculture

• 16th largest aquaculture producer (NOAA, 2018)

• $14 billion seafood trade deficit 2016 (NOAA, 2018)

• Not developing as quickly as other countries (FAO, 2013)

• 22% decline in U.S. aquaculture (Olin, 2011)
  • Increased feed costs (Engle and Stone, 2013)
  • Increased pressure from imports (Engle and Stone, 2013)
  • Regulatory environment (Engle and Stone, 2013)
Current state of U.S. aquaculture

2015 Aquaculture Production Highlights

Marine and Freshwater National Totals

U.S. Value

- $1.4 billion dollars
- 21% of total U.S. seafood production & fishery products by value

U.S. Production

- 627 million pounds
- 16th in global aquaculture production

Marine Species Totals

- Oysters: $173 million, 35 million pounds
- Clams: $122 million, 9 million pounds
- Salmon: $88 million, 48 million pounds
- Shrimp: $11 million, 4 million pounds
- Mussels: $10 million, 0.7 million pounds

Regional Marine Totals

- Pacific: 36% by value
- Atlantic: 41% by value
- Gulf of Mexico: 23% by value

NOAA FISHERIES
Current state of U.S. aquaculture

- United States
- World

SOURCE: FAO (2016)
The Regulatory Environment

- The Lacey Act of 1900 and inter-state transport of aquatic species
  - Listing of “injurious” species
  - 5 years in federal prison
  - Fines up to $500,000

- Permit for aquaculture in federal marine waters
  - Multiple agency involvement
  - Lengthy process may include NEPA assessment

- Complete ban of finfish culture in Alaska
The Regulatory Environment
The Regulatory Environment

- U.S. had the 3rd most stringent set of regulations (Abate et al. 2016)
- U.S. had 2nd lowest growth rate of aquaculture
- Calls for relief from the industry for decades (Anonymous 1979a and Gibson 1979b)
- Significant negative relationship between regulations & growth of aquaculture
- Evidence that regulatory environment can affect aquaculture growth and development (Asche and Roll, 2013)
CORE PROBLEM

It’s NOT the laws!

It’s how the laws are implemented...
An Example...

VIOLATION!

CORRECTIVE ACTION REQUIRED.
Farmer spent $20,000 following the instructions to make corrections. (90% of his take-home cash for the year)
An Example...

A month or two after completing the work “required”...
An Example...

FELONY!
THE WORK SHOULD NOT HAVE BEEN DONE.
An Example...

At this point, attorneys got involved...
When all was said and done, both inspectors had been wrong in terms of what they told the farmer to do. The farmer was never compensated for money spent; and he had a substantial loss for the year.
Response Rates

- **Fish**: 34% coverage
- **Oysters**: 27% coverage
- **Trout**: 63% coverage
The on-farm cost of regulations
Biggest challenge to the farm business?

Regulations

Labor  Markets  Weather  Pollution
Ocean acidification  Predation
The on-farm cost of regulations
Do you know of farms that have gone out of business due to regulations?

>50% said “YES”
Permits & Licenses

What we are seeing in the data

- Permits delayed for 5, 10, 15 years
- Not possible to expand existing businesses
- Total of 315 regulatory filings captured

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Per farm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Mean</td>
</tr>
<tr>
<td>California</td>
<td>90</td>
<td>7</td>
</tr>
<tr>
<td>Oregon</td>
<td>22</td>
<td>4</td>
</tr>
<tr>
<td>Washington</td>
<td>203</td>
<td>7</td>
</tr>
<tr>
<td><strong>West Coast</strong></td>
<td><strong>315</strong></td>
<td><strong>6</strong></td>
</tr>
</tbody>
</table>
### Permits & Licenses

#### 6 REGULATORY CATEGORIES

<table>
<thead>
<tr>
<th>Category</th>
<th>By Number</th>
<th>By Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquaculture / Propagator Permit</td>
<td>44%</td>
<td>28%</td>
</tr>
<tr>
<td>Interstate Transport</td>
<td>11%</td>
<td>2%</td>
</tr>
<tr>
<td>Environmental Management</td>
<td>20%</td>
<td>66%</td>
</tr>
<tr>
<td>Fish Health</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Legal and Labor Standards</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Food Safety</td>
<td>22%</td>
<td>2%</td>
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</table>
## Regulatory Cost

### Costs of Regulatory Categories *Per Farm*

<table>
<thead>
<tr>
<th></th>
<th>Permits &amp; licenses</th>
<th>Direct costs (other than permits)</th>
<th>Manpower</th>
<th>Changes due to regulations</th>
<th>Lost opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State</strong></td>
<td><strong>Mean</strong></td>
<td><strong>Mean</strong></td>
<td><strong>Mean</strong></td>
<td><strong>Mean</strong></td>
<td><strong>Mean</strong></td>
</tr>
<tr>
<td><strong>CA</strong></td>
<td>$6,065</td>
<td>$408,018</td>
<td>$50,292</td>
<td>$97,798</td>
<td>$722,148</td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td>$6,920</td>
<td>$10,364</td>
<td>$13,218</td>
<td>$13,640</td>
<td>$390,486</td>
</tr>
<tr>
<td><strong>WA</strong></td>
<td>$12,129</td>
<td>$88,347</td>
<td>$49,290</td>
<td>$39,787</td>
<td>$1,145,284</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$9,944</strong></td>
<td><strong>$166,801</strong></td>
<td><strong>$45,804</strong></td>
<td><strong>$52,774</strong></td>
<td><strong>$952,000</strong></td>
</tr>
</tbody>
</table>
Two parts to this

- **Regulatory cost associated with obtaining permits**
  - Investing in infrastructure, and permit delay
  - Incurring legal fees, consulting fees, surveys/analysis

- **Regulatory cost of compliance and monitoring**
  - Annual/quarterly/monthly reporting
  - Laboratory testing
  - Record keeping
Regulatory Cost

COST ASSOCIATED WITH OBTAINING PERMITS > COST OF COMPLIANCE AND MONITORING
The on-farm cost of regulations
West Coast Shellfish

Existing Permitting Processes 6/23/2012
SEQUENTIAL PERMITS
INITIAL PROCESSES

Health Growing Area Classification
DNR Ownership Determination
Tribal Interest Determination
Local Pre-submission Conference
SEQUENTIAL PERMITS
INITIAL PROCESSES

JARPA
SEQUENTIAL PERMITS

NMFS ESA/MSA

US FWS ESA/MSA

NHPA 106

JARPA

Nationwide Permit

Completeness Determination

Tribal Notification

Corps Memo

Ecology 401/CZM
The on-farm cost of regulations
West Coast Shellfish

UNINTENDED CONSEQUENCES

How many farms can survive in a competitive market, while waiting on a permit?

Shellfish permits specify type of gear.

New, more efficient gear requires new permits.

Permitting delays make adoption infeasible.

Small-scale farms cannot adopt gear better for farms & environment.
## Regulatory Cost

**WITHOUT FOREGONE OPPORTUNITIES AND LOST MARKETS**

<table>
<thead>
<tr>
<th>State</th>
<th>$/state</th>
<th>Mean $/Farm</th>
<th>Median $/Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>$7,308,242</td>
<td>$562,172</td>
<td>$146,675</td>
</tr>
<tr>
<td>Oregon</td>
<td>$220,710</td>
<td>$44,142</td>
<td>$34,830</td>
</tr>
<tr>
<td>Washington</td>
<td>$5,686,550</td>
<td>$189,552</td>
<td>$36,262</td>
</tr>
<tr>
<td><strong>West Coast</strong></td>
<td><strong>$13,215,502</strong></td>
<td><strong>$275,323</strong></td>
<td><strong>$53,694</strong></td>
</tr>
<tr>
<td><strong>Adjusted for coverage</strong> (74% coverage rate)</td>
<td><strong>$17,858,787</strong></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
The on-farm cost of regulations

AKA: RESULTS

$18 Million
Without lost sales and lost opportunities

$12 Million

$28 Million
The on-farm cost of regulations
West Coast Shellfish

TOTAL ANNUAL REGULATORY COST
$17,858,787

MEAN REGULATORY COST PER FARM
$275,323

MEAN REGULATORY COST PER ACRE PER FARM
$37,473

(EXCLUDING THE VALUE OF FOREGONE OPPORTUNITIES AND LOST MARKETS)
Regulatory Effects on the Value of the Shellfish Industry?

• Maybe we can think of lost sales and lost opportunities, almost as an estimate of what the industry could have been?

• The effects of the unintended consequences and implementation of regulations have constrained the growth of the shellfish industry...
Regulatory Effects on Value?
West Coast Shellfish

$224,492,264

LOST SALES
$84,186,333

LOST OPPORTUNITIES
$125,620,000
What Next?

- Additional aquaculture sectors (2018 – 2020)

AR Catfish Promotion Board
What Next?

- Additional aquaculture sectors (2018 – 2020)

East Coast Shellfish including...

MARYLAND
Seed availability
Theft of oysters
Lack of available loans
Pollution of water
Death of oysters
Bottom type
Poor or slow growth
Market price
Market availability
Acquiring leases/permits
Other regulations

Traditional
Container
Regulatory Effects on Value?

- Can we assume the costs and effects are the same between the West Coast and the East Coast?
- Probably not...
- So, let’s measure them...
Survey Design and Methods

• **Designed and conducted as a census**
• Contact lists developed with aid from state extension specialists, aquaculture coordinators, associations, and state agencies
• Verification of producer status through telephone contact
• **Surveys completed through in-person interviews**
Survey Design and Methods

- Survey designed to capture:
  1. Descriptive information
  2. Farm production costs
  3. Farm marketing costs
  4. Farm sales
  5. Regulatory compliance activities
  6. Regulatory compliance costs
  7. Other metrics
Survey Design and Methods

• Confidentiality
  • Private business data
  • Markets
What Next?

• Soliciting input from growers and stakeholders in the region
  • To inform development of contact lists
  • Specific issues/challenges that are of importance
  • Information that is of benefit to the industry

• Please contact us if you have any information or would like to share your insights or story
Acknowledgements

- All survey participants
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Comments & Questions

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