Economic Impact of West Coast Shellfish Aquaculture

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Working waterfronts look like...
But nostalgia cannot

• Keep working waterfronts viable
• Build policy for marine-dependent uses
Next 12 Minutes...

Partnership to gather economic impact data:
• Research objectives & rationale
• Shellfish aquaculture in WA, OR & CA
• Pacific Shellfish Institute
  – Who we are & unique position
• Survey development & distribution
• Findings
  – Value, Jobs, Shellfish production
Research Objectives

• Quantify the economic impact of commercial shellfish production
• Estimate a production function and build an Input-Output (I/O) model for shellfish aquaculture
• Support sustainable shellfish growing communities
Rationale

• Lack of accurate economic & production data for West Coast shellfish aquaculture
• Data need among:
  – State & federal regulators
  – Local planning councils
  – Trade associations
  – Research organizations
  – NGOs
Shellfish Aquaculture
WA Shellfish Farms

Harvesters (90)
Shellfish Processors (23)
Shellstock Shippers (239)
OR Shellfish Aquaculture

Growers (23)
Shellfish Processors (8)
Shellstock Shippers (37)
CA Shellfish Aquaculture

30 Marine Aquaculturists
16 active bivalve producers
Research Approach

Task 1:
- Survey WA, OR, and CA shellfish growers on revenue & expenditures

Task 2:
- Build an Input-Output model for bivalve shellfish production
Pacific Shellfish Institute - PSI

- Olympia based 501c(3)
- Established in 1995 as a private non-profit corporation with strong linkages to PCSGA
- In 2004, PCSGA voted to change PSI Bylaws to provide a clearer separation from PCSGA
Key Respondent Significance

- ID expense categories for general survey
- ID where expenses occur
  - IMPLAN sector (similar to NAICS code)
  - County-level spending patterns

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Description</th>
<th>IMPLAN Code</th>
<th>IMPLAN Description</th>
<th>Zip Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commencement Bay Corrugated</td>
<td>Cardboard boxes for shipping</td>
<td>107</td>
<td>Paperboard container manufacturing</td>
<td>98360</td>
</tr>
</tbody>
</table>
Dear Shellfish Aquaculture Company Manager,

In the interest of your industry, I urge you to complete and return this survey. The purpose of this survey is to quantify the economic impacts of commercial shellfish aquaculture. This is a critical step to demonstrate the positive influence shellfish aquaculture has on our local communities and regional economies. Many aquaculture operations, however, struggle to obtain economic and production data for shellfish for decades and it’s finally within our grasp.

**Why Should I Complete the Survey?**

This research cannot be completed without individual business’s expertise; completing this survey takes time, but I hope the resulting benefits—metrics that demonstrate the positive economic contribution of shellfish—will be worth it. For example, the outcome of this survey will yield multipliers, a way to calculate the economic impact. Multipliers help demonstrate how investment in aquaculture generates economic activity for locals, which in turn affects the region.

Multipliers generated from this research will specifically represent other “industry multipliers” sometimes quoted in the media and by multipliers. Understanding both employment and revenue because shellfish aquaculture is so far removed from many other fisheries, agricultural crops or animal production, rather than the urban agglomeration.

Responses are strictly confidential and under no circumstances will information be shared or reported in any way. The results of this study protect the privacy of all respondents. The individual responses will be used such that the details of any operation will not be revealed. This includes some circumstances; individual companies could be identified based on the names of the folks surveyed, e.g. Bobbi Hudson, research biologist, and Kristin Rasmussen, etc., in compiling and summarizing survey responses.

**Shellfish Aquaculture Expenses Survey**

<table>
<thead>
<tr>
<th>Tidelands permitted for aquaculture and under your control (owned, leased, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location (County)</strong></td>
</tr>
<tr>
<td><strong>Size (Acres)</strong></td>
</tr>
<tr>
<td><strong>Species cultured</strong></td>
</tr>
</tbody>
</table>

Of the total tidelands listed above, how many acres were not under cultivation in 2010? ___ acres

In a typical year, what percentage of your tidelands are not under cultivation? ___%

**Expenses for the 2010 Calendar Year**

<table>
<thead>
<tr>
<th>Total Expenses</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Labor Expenses</strong></td>
<td></td>
</tr>
<tr>
<td>Total Payroll (wages)</td>
<td>$</td>
</tr>
<tr>
<td>Total Non-Wage Benefits</td>
<td>$</td>
</tr>
<tr>
<td><strong>Payments to Government</strong></td>
<td></td>
</tr>
<tr>
<td>Federal</td>
<td>$</td>
</tr>
<tr>
<td>State &amp; Local</td>
<td>$</td>
</tr>
<tr>
<td><strong>Other Expense Categories</strong></td>
<td></td>
</tr>
<tr>
<td>Tideland Leases</td>
<td>$</td>
</tr>
<tr>
<td>Capital Expenditures</td>
<td>$</td>
</tr>
<tr>
<td>Seed &amp; Shellfish</td>
<td>$</td>
</tr>
<tr>
<td>Insurance Carriers</td>
<td>$</td>
</tr>
<tr>
<td>Freight</td>
<td>$</td>
</tr>
<tr>
<td>Gas/Fuel</td>
<td>$</td>
</tr>
</tbody>
</table>

Likely more than the sum of categories listed below:

- Owners and employees
- Include medical, bonuses, etc.
- Include payroll taxes, income taxes, etc.
- Include permit and license fees, property taxes, etc.
- Lease payments for tidelands, but not permit fees
- Include vessels, buildings & heavy machinery > $10K
- Payments for seed or shellfish for grow-out or resale
- Total payments to insurance companies
- Expenses paid to freight companies (ground & air)
- Expenses paid to fueling stations or fuel deliveries
## WA + OR + CA: Harvested & Sold

<table>
<thead>
<tr>
<th>Product</th>
<th>Reported 2010 Harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oysters</td>
<td>4M dozen</td>
</tr>
<tr>
<td></td>
<td>1M gallons</td>
</tr>
<tr>
<td>Mussels</td>
<td>3.3M pounds</td>
</tr>
<tr>
<td>Geoduck</td>
<td>1.3M pounds</td>
</tr>
<tr>
<td>Manila clams</td>
<td>6.7M pounds</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>79.1M pounds</strong></td>
</tr>
</tbody>
</table>

Total from 84 survey respondents.
## WA Production Comparison

<table>
<thead>
<tr>
<th>Shellfish Type</th>
<th>WDFW</th>
<th>PCSGA</th>
<th>PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oysters (2010)</td>
<td>8.7*</td>
<td>61.0</td>
<td>8.8* (53.9)</td>
</tr>
<tr>
<td>Mussels (2010)</td>
<td>2.9</td>
<td>2.8</td>
<td>2.9</td>
</tr>
<tr>
<td>Geoduck (2010)</td>
<td>1.3</td>
<td>1.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Manila clams (2010)</td>
<td>6.1</td>
<td>9.5</td>
<td>6.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>21.5</td>
<td>74.9</td>
<td>64.7</td>
</tr>
</tbody>
</table>

**Million pounds** harvested in 2010 according to:
- WDFW aquaculture production reports
- PCSGA industry estimate
- PSI survey responses

*meat only weight*
# Summary by State

<table>
<thead>
<tr>
<th></th>
<th>WA</th>
<th>OR</th>
<th>CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total State Acres</td>
<td>29,403</td>
<td>5,011</td>
<td>6,201</td>
</tr>
<tr>
<td>Acres reported</td>
<td>22,502</td>
<td>3,043</td>
<td>6,201</td>
</tr>
<tr>
<td>Actively farmed acres</td>
<td>62%</td>
<td>32%</td>
<td>12%</td>
</tr>
<tr>
<td>Employment</td>
<td>1,266</td>
<td>108</td>
<td>204</td>
</tr>
<tr>
<td>Revenue</td>
<td>$90.3M</td>
<td>$9.3M</td>
<td>$25.8M</td>
</tr>
<tr>
<td>Spending</td>
<td>$69.8M</td>
<td>$0.38M</td>
<td>$11.9M</td>
</tr>
<tr>
<td>Spending/farmed acre</td>
<td>$4,988</td>
<td>-</td>
<td>$16,017</td>
</tr>
<tr>
<td># Farms</td>
<td>32</td>
<td>4</td>
<td>16</td>
</tr>
</tbody>
</table>
Expense Summary by State

WA - $69.8M (32 farms)
- Payroll: 22%
- State & Local Tax: 19%
- Insurance: 11%
- Leases: 6%
- Gas/Fuel: 5%
- Benefits: 4%
- Freight: 2%
- Capital Expenses: 2%
- Other Spending: 1%

OR - $0.38M (4 farms)
- Payroll: 63%
- State & Local Tax: 9%
- Insurance: 7%
- Leases: 5%
- Gas/Fuel: 4%
- Benefits: 1%
- Freight: 1%
- Capital Expenses: 1%
- Other Spending: 1%

CA - $11.9M (16 farms)
- Payroll: 50%
- State & Local Tax: 18%
- Insurance: 8%
- Leases: 4%
- Gas/Fuel: 4%
- Benefits: 4%
- Freight: 3%
- Capital Expenses: 1%
- Other Spending: 1%
WA Shellfish Aquaculture in 2010

• Farms spent $101.4M
  – generated $184M or 1.8 times the activity
• 1,900 direct jobs
  – +810 jobs (indirect & induced)
  – 2,710 total jobs
• Paid $37.3M in wages
  – generated additional labor income of $39.9M
  – $77.M total wages
CA Shellfish Aquaculture in 2010

• Farms spent $11.9M
  – generated $23.3M or 1.9 times the activity
• 200 direct jobs
  – +80 jobs (indirect and induced)
  – 280 total jobs
• Paid $5.4M in wages
  – generated additional labor income of $4.6M
  – $10M total wages
Economic Impact by County (WA)
## WA Economic Impact

<table>
<thead>
<tr>
<th>Multipliers per $</th>
<th>Output</th>
<th>Employment</th>
<th>Labor Income (LI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>$101,418,100</td>
<td>1,900</td>
<td>$37,290,600</td>
</tr>
<tr>
<td>Indirect</td>
<td>$38,319,900</td>
<td>390</td>
<td>$21,281,600</td>
</tr>
<tr>
<td>Induced</td>
<td>$44,802,000</td>
<td>420</td>
<td>$18,664,700</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$184,540,000</strong></td>
<td><strong>2,710</strong></td>
<td><strong>$77,236,900</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Multiplier</th>
<th>Output (per $)</th>
<th>Employment (per $M)</th>
<th>LI (per $)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Multiplier</strong></td>
<td>1.82</td>
<td>26.72</td>
<td>0.76</td>
</tr>
</tbody>
</table>
Additional Areas of Interest

• Sales trends and demand factors
• Economic impact of shellfish consumption
  – Retail markets
  – Restaurants
  – Festivals & fundraisers
  – Culinary tourism
NOAA Funding

NOAA Sea Grant Aquaculture Research Program
NA10OAR4170057

Research partners (economic tasks only):

Pacific Shellfish Institute
Northern Economics
Sea Grant Oregon
Ted Kuiper
Thank you!

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