**Investment in Fisheries Economics Education: Trends from the Published Record**

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The published record reflects the intellectual activity in a discipline. In marine resource economics, that record includes 1) theses and dissertations, 2) peer-reviewed articles, 3) industry and government reports, and 4) conference proceedings. For this analysis, we focused on the first and second classes of publications as a means of investigating the investment in educating fisheries economists in the US and Canada.

**Class One: Theses and Dissertations**

**Methodology**

We collected data on the theses and dissertations published since 1960 through 2011 from North American universities. Our primary data source was the *OCLC Worldcat Database*, although we also used the *Dissertation Abstracts* and the *Networked Digital Library of Theses & Dissertations*. These resources have a bias towards dissertations as not all institutions submit their masters level information to these sources. Consequently, we selectively examined the local catalogs and departmental electronic records of universities that appeared to have marine resources economics programs. Close to 900 items were identified, but not all had adequate information for analysis. These were winnowed to 721 records with author, title, date, degree, institution and department. Of these, 421 did not have accessible abstracts, so the analysis was conducted on information from the titles and available abstracts. Six of these were law degrees and were eliminated. The total number of these and dissertation analyzed was 715.

**General Trend of Number of Degrees Granted** (Graphs 1-4)

The National Center for Science and Engineering Statistics[[1]](#footnote-1) compiles an annual report using data from various surveys of U.S. degree granting institutions. The focus is on science and engineering. although data is also collected on economic degrees. There are ten to twelve times more masters degrees than doctoral degrees in science and engineering with an accelerating level of masters degrees since the mid 1990's relative to PhD's. For economics, masters degrees are approximately only three times as high as PhD's. Growth in masters began climbing in 2001 (possibly due to changing national economic conditions) followed by increasing growth in PhD's.

The trend in fisheries economics degrees is somewhat different than the trends for all economic degrees. The field only began developing in the 1960’s and growth continued until 1980 where it stayed relatively flat until the late 1990’s (approximately 18-20 combined masters and PhD degrees per year) and then began growing totaling approximately 25-27 total degrees per year through 2004-2011. Doctorate degrees showed especially strong growth with 23 degrees in 2010 compared to only eight masters degrees. These trends may reflect a bias in our data source as noted in the methodology section. However, it may point out a concern over the value or availability of masters programs.

**Trends by Topic Area in Fisheries Economics** (Graphs 5-9, Chart 1)

We sorted the theses and dissertations into major topic areas identified through conversation with experts and perusal of the literature. The topic areas are:

* Production (n=194)
* Aquaculture (n=105)
* Markets & Trade (n=120)
* Management (including regulation and policy) (n=244)
* Recreation (n=52)

**Trends for Degree-Granting Institutions** (Graph 10-15)

Fifteen universities account for 440 or 61.5% of degrees with theses/dissertation topics in fishery economics granted between 1960 and 2011 (Table 1 and Table 2).

The results illustrate a number of trends:

* A decrease in graduates over time at a number of the larger “traditional” programs
* A significant increase in PhD’s in absolute numbers and relative to thesis-based masters degrees
* Establishment of new programs over the last decade in four/five Universities
* Relatively flat growth in most topic areas with the exception of aquaculture and management and policy (especially after 2000)
* Growing importance of “other institutions.”

With respect to the more “traditional” programs, at the University of Rhode Island the number of masters theses decreased significantly and dissertations proportionately increased. Overall, however, total theses and dissertations decreased by 60% after 1993 compared to the previous 17 year period. The 60% decrease at Oregon State University after 1989 reflects a significant decrease in fisheries and marine economics faculty (from five in 1989 to one by 2010). University of Washington’s program focuses on the masters of marine affairs. Auburn degrees are primarily aquaculture focused.

**Table 1 Top degree granting institutions**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Ph.D.** | | **M.S.** | | **Other Masters** | | **Total** |
|  | 1960-1995 | 1996-2011 | 1960-1995 | 1996-2011 | 1960-1995 | 1996-2011 |  |
| University of Rhode Island | 29 | 25 | 38 | 5 | 5 | 1 | 103 |
| Oregon State University | 30 | 6 | 12 | 3 |  | 3 | 54 |
| University of Washington | 2 | 8 | 1 | 1 | 20 | 20 | 52 |
| Auburn University | 6 | 8 | 17 | 5 |  |  | 36 |
| Simon Fraser University | 3 | 3 | 1 | 2 | 17 | 6 | 32 |
| University of Florida | 13 | 6 | 6 | 2 | 1 | 1 | 29 |
| Texas A&M University | 8 | 6 | 7 | 1 | 2 |  | 24 |
| University of California Davis | 7 | 9 | 2 | 2 |  |  | 20 |
| University of Hawaii at Manoa | 7 | 4 | 2 |  | 1 | 1 | 15 |
| Mississippi State University | 3 | 2 | 3 | 6 |  |  | 14 |
| University of Alaska Fairbanks |  | 2 | 6 | 6 |  |  | 14 |
| University of British Columbia | 1 | 7 |  | 5 |  |  | 13 |
| Memorial University of Newfoundland | 1 | 1 |  | 2 | 3 | 5 | 12 |
| University of Delaware | 2 | 3 | 1 | 1 | 1 | 3 | 11 |
| McGill University | 5 |  | 2 |  | 3 | 1 | 11 |
| **Total** | **117** | **90** | **98** | **41** | **53** | **41** | **440** |
| Other Institutions (124) | 57 | 108 | 25 | 36 | 29 | 20 | 275 |
| **Grand Total** | **174** | **198** | **123** | **77** | **82** | **61** | **715** |

**Table 2: Top degree grant institutions over time with rankings**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **1960-1995** | | | **1996-2004** | | | **2005-2011** | | |
|  | Ph.D | Masters | Rank | Ph.D | Masters | Rank | Ph.D | Masters | Rank |
| University of Rhode Island | 29 | 43 | **1** | 13 | 5 | **1** | 12 | 1 | **2** |
| Oregon State University | 30 | 12 | **2** | 3 | 5 | **3** | 3 | 1 | **7** |
| Auburn University | 6 | 17 | **3** | 3 | 2 | **6** | 5 | 3 | **4** |
| University of Washington | 2 | 21 | **3** | 3 | 11 | **2** | 5 | 10 | **1** |
| Simon Fraser University | 3 | 18 | **4** | 2 | 5 | **4** | 1 | 3 | **7** |
| University of Florida | 13 | 7 | **5** | 2 | 1 | **7** | 4 | 2 | **5** |
| Texas A&M University | 8 | 9 | **6** | 2 | 1 | **7** | 4 | - |  |
| University of Hawaii at Manoa | 7 | 3 | **7** | 3 | - |  | 1 | 1 |  |
| University of California Davis | 7 | 2 | **8** | 5 | 2 | **4** | 3 | 1 | **7** |
| McGill University | 5 | 3 | **9** |  | 2 | **9** | 2 | 3 | **6** |
| Mississippi State University | 3 | 3 | **10** | 1 | 2 | **9** | 1 | 4 | **6** |
| University of Alaska Fairbanks | - | 6 | **10** | 1 | 4 | **6** | 1 | 2 |  |
| University of Maine | - | 6 | **10** | 1 | 1 | **8** | - | - |  |
| Michigan State University | 3 | 3 | **10** | - | - |  | - | - |  |
| University of Delaware | 2 | 2 |  | 3 | 3 | **5** | - | 1 |  |
| University of California Berkeley | 2 | - |  | 4 | - |  | 3 | - |  |
| University of California Los Angeles | 2 | 1 |  | 4 | - |  | - | - |  |
| University of British Columbia | 1 | - |  | 2 | - |  | 5 | 5 | **3** |
| University of California San Diego | - | - |  | - | - |  | 6 | - | **5** |
| University of California Santa Barbara | - | - |  | - | - |  | 6 | - | **5** |
| Memorial University of Newfoundland | 1 | 4 |  | 1 | 2 |  | - | 5 | **6** |
| University of Arizona | - | - |  | - | - |  | 3 | 1 | **7** |
| University of Manitoba | - | - |  | - | - |  | 2 | 3 | **6** |

**Sector One: Theses and Dissertations – Graphs and Charts**

**Graph 1: U.S. Science & Engineering Degrees Granted 1966-2008**

**Graph 2:** **U.S. Economics Degrees Granted 1966-2008**

**Graph 3:** **North American Fisheries Economics Degrees 1960-2011 (n=715)**

**Graph 4: North American Fisheries Economics Masters Degrees 1960-2011 (n=343)**

**Graph 5: Production Economics (n=194)**

**Graph 6: Aquaculture Economics (n=105)**

**Graph 7: Markets & Trade (n=120)**

**Graph 8: Management, Policy and Regulations (n=244)**

**Graph 9: Recreation Economics (n=52)**

**Chart 1: All theses and dissertations by topic**

**Graph 10: University of Rhode Island 1972-2010 (n=97)**

**Graph 11:** **Oregon State University 1964-2010 (n=49)**

**Graph 12: University of Washington (n=52)**

**Graph 13: Auburn University 1971-2010 (n=36)**

**Graph 14: All other institutions 1963-2011 (n=217)**

**Class Two: Peer reviewed publications addressing marine resource economics**

**Methodology:**

We collected data on peer-reviewed publications in fisheries economics in two primary ways. First, we conducted preliminary keyword and phrase searches in Web of Knowledge (WOK) using the following strategies:

* fisher\* NEAR/2 econom\*
* aquaculture NEAR/1 econom\*
* “marine resource economics”
* seafood NEAR/2 econom\* OR seafood NEAR/1 market\*

Only articles and reviews were selected resulting in 789 possible items. These were further examined and we discarded irrelevant publications and those published in 2013 resulting in 571 publications. These preliminary results indicated that major sources of marine resource economics articles were inadequately covered in WOK. A similar keyword search was then conducted in *EconLit* with similar restrictions on year range (1967-2012) and type of publications. This produced an additional 378 relevant items primarily from *Aquaculture Economics and Management*. From these initial results, we searched further to ensure that articles in the field’s core journals were included in the data to be analyzed. A total of 2422 records were analyzed.

Another search technique would have been to conduct a broader keyword search in *EconLit* (similar keywords without the restriction of proximity to the term “economy\*”. This will be done at a later date as a means of comparing datasets for researcher bias.

**General trends in peer-review publications**

There is a steady growth in the number of articles published and the number of outlets. Even so, eight journals account for 73% of the articles published and five of these account for 64%. Noticeable spikes are due to a high number of articles in a 2010 issue of *Marine Policy* and a special issue of the same in 2012. Further analysis will be ongoing to differentiate publications by other key criteria (e.g., organization, topics.)

**Graph 1: Growth in Number of Articles Published (n=2422)**

**Graph 2: Trend in Journals with more than 50 Articles (n=1768)**

**Graph 3: Journals with more than 50 Articles (n=1768)**

1. National Science Foundation, National Center for Science and Engineering Statistics. 2011. *Science and Engineering Degrees: 1966–2008.* Detailed Statistical Tables NSF 11-316. Arlington, VA. Available at <http://www.nsf.gov/statistics/nsf11316/> [↑](#footnote-ref-1)