Aquaculture in Rhode Island

2001 Yearly Status Report

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Prepared by:

David Alves
Aquaculture Coordinator

Coastal Resources Management Council
4808 Tower Hill Rd.
Wakefield, RI 02879-1900

A snapshot of the Aquaculture Industry in Rhode Island

For the year 2001

- **The farm gate value of Rhode Island aquaculture products decreased 4.7% due to the economic slow down.**
- **This is the first decrease in the past 6 years.**
- **The number of farms in Rhode Island increased 38%.**
- **The total acreage under cultivation in Rhode Island increased 72% to 51.5 acres.**
- **Aquaculture related industries in Rhode Island had gross revenue of $3.9 million during the calendar year 2001. An increase of 26%.**
- **The RI CRMC received a $1.5 million grant for the "Rhode Island Aquaculture Initiative" to be used towards aquaculture planning and advancement.**
- **The two universities conducting aquaculture related research in Rhode Island brought in $1.5 million from outside sources during the year 2001.**
- **Aquaculture directly supported 65 full time employees and 11 part time employees during 2001.**
- **The total contribution of aquaculture to the economic bottom line of the State of Rhode Island was $5.5 million. This figure does not include the $1.5 million Rhode Island Aquaculture grant or the $1.7 million tuition paid by aquaculture students at URI.**
- **CRMC initiates aquatic an Bio-Security Board to protect Rhode Island's cultured and indigenous species.**
- **Regulatory agencies charged with responsibility for aquaculture continued to make progress in streamlining the permitting process.**
- **Regulatory agencies continued to involve stakeholders in the planning and regulation of aquaculture during the year 2001.**
- **Rewriting of fishery and aquaculture regulations will put Rhode Island at the forefront for rational regulations.**

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Introduction

The first year of the new millennium was a year of mixed growth for the aquaculture industry. The farm gate value of the industry decreased approximately $14,979 for a 4.7% loss. The farm gate value is the value of the crop to the farmer; this does not include any economic multipliers or external benefits. This decrease was due to the economy slowing in the first half of the year, then exacerbated by a decrease in restaurant sales after the September 11 attacks. The total farm gate value of aquaculture in Rhode Island for 2001 was $299,998. Once again 100% of all aquaculture in Rhode Island in 2001 resulted from shellfish culture. In 2001 Rhode Island aquaculture farms employed 11 people full time, down one position from 2000; 13 people part time year round, an increase of one position from 2000; and 3 people part time seasonally, the same number as in 2000. These employment numbers do not include the principals for the five new farms permitted in 2001. The number of farms increased to 18, a 38% increase from 2000. The acreage under lease in Rhode Island increased 72% in 2001, from 30 acres in 2000 to 51.5 acres in 2001. It takes two to three years for a newly permitted farm to reach full production. Thus, the growth figures for leased land are indications that aquaculture's contribution to the economic bottom line of Rhode Island will continue to grow in the years to come.

It is recognized that aquaculture is not only the production of food products, but additionally ancillary industries are also important to the state's economy. There are two universities in the state featuring aquaculture in their programs: the University of Rhode Island and Roger Williams University. Between the two, the universities brought in $1,313,654 in outside monies to pursue aquaculture research. This figure is a 31% decrease from last year's numbers. In 2001 the universities employed 12 professors who worked in some capacity on research connected with aquaculture. This is down from 27 professors last year; there were 10 professional staff, down from 14 last year; for a total of 26 (versus 41 in 2000) people employed related to education and aquaculture research. At the University of Rhode Island there are 19 graduate students (versus 30 in 2000) also pursuing research related to aquaculture. The decrease in research conducted at the universities led to decreases in the number of faculty and graduate students conducting aquaculture related projects. Additionally, there are 78 undergraduate students enrolled in the Fisheries and Aquaculture Technology program at URI bringing in a total of $1,575,000.00 in tuition and housing expenditures (this figure was not included in the overall worth of aquaculture

reported earlier). Both universities also play an important role in the transfer of technology from the academic realm to industry.

Other industries that generate revenue and jobs in the state include the distribution of aquacultured product along with the manufacturing and sales of aquaculture related products. This part of the aquaculture industry generated $3,900,000 to the state's economy in 2001. This is an increase of 26% from last year's figures. The increase is greater than first appears as one of the three companies that volunteered gross sales figures last year refused to do so this year. This sector employed 16 full time employees and 3 part time seasonal employees. These income figures are based on the companies gross income attributed to aquaculture.

The total worth of aquaculture and the related industries to the economic well being of the State of Rhode Island was $5,513,652 for the year 2001. This is an increase of 2.7%. There were a total of 76 people employed full time, 11 part time year around, and 3 part time seasonal in the aquaculture and related industries.

On the regulatory front, a number of gains initiated in 2000 were built upon during 2001. The largest and most important development is the rewriting of all aquaculture regulations by the Department of Environmental Management (DEM). This collaborative effort included the aquaculture industry, the fishing industry and regulatory agencies. Credit has to go to all of the participants who gave their time to ensure this effort was productive. At this time, pending legislative approval, Rhode Island will be a leader in innovative and effective regulation of the aquaculture industry.

In November, at the 2nd Southern New England Aquaculture Conference it was announced that $1.5 million, secured through the effort of Senator Jack Reed, had been appropriated for planning and advancement of aquaculture in Rhode Island. The project, entitled the "Rhode Island Aquaculture Initiative," should begin to positively affect the state of aquaculture in Rhode Island in 2002. The grant will be used to fund projects in the following areas:

- A series of large research grants in areas of direct application to the Rhode Island aquaculture industry.
- A series of mini-grants to help new entrants enter the industry and to encourage existing farmers to diversify into new areas. The grants will fund the purchase of seed and material while the farmer contributes sweat equity.
- To fund two extension positions: one in shellfish aquaculture at Roger Williams University and the other a finfish specialist at the University of Rhode Island. Both positions will enhance the existing aquaculture industry through diversification into the culture of new species.
- Projects that are currently underway, the charting project started by the CRMC working group, the Roger Williams University shellfish restoration project (initially funded by the U.S. Department of Commerce), and support for the feasibility study/business plan creation for an Aquaculture/Marine Bio-Technology Park in Rhode Island.

The intent of all concerned with the administration of this grant is that this opportunity will not be wasted, furthermore, is intended that the maximum amount of money will be utilized directly to help increase the aquaculture industry in Rhode Island. The web page for this initiative can be accessed at:

http://seagrant.gso.uri.edu/research/rhodyaquaculture/rhodyaquaculture.html.

The CRMC working group on aquaculture and fisheries did not meet in 2001. The group decided not to meet because of the heavy schedule of meetings all winter concerning the rewriting of the above-mentioned regulatory framework for aquaculture and fisheries. The group continues to communicate freely and the relationship built up over the years continues to be constructive for all concerned. The group is comprised of representatives from commercial and recreational fishing groups, aquaculturists, academia, and regulatory agencies. The group's project to chart the current uses of the state's waters is now on the web at http://narrbay.org. The Aquaculture and Fisheries resource can be accessed under the "quick picks" header. Leading to the home page of the mapping project. This project has already proven valuable to site aquaculture projects. DEM has already used the data on their web page's oil spill response maps.

The University of Rhode Island Cooperative Extension Service has supported the effort to digitize the data collected from the charting project and hosting it on the web. This charting project will be a valuable tool for reducing conflict between traditional users and any future development of the state's waters, not just determining the optimum sites of aquaculture projects. This is evidenced by the DEM Oil Spill Response group's use of the charts on their web page. All prospective aquaculture lease applicants are directed to the charting project web page in the early stages of proposal development. This has helped to decrease conflict associated with site selection.

During 2001, the CRMC Biosecurity Board was formed. The seven member board is charged with assisting and advising the Coastal Resources Management Council on issues concerning aquatic disease importation, federal regulations pertaining to aquatic disease issues and importation of non-indigenous species into Rhode Island waters. The board is made up of representatives from CRMC, the state veterinarian, a specialist in public health from the Department of Health, the RI Marine Fisheries Council, DEM Division of Fish & Wildlife, the RI aquaculture industry and the URI Department of Fisheries, Animal & Veterinary Sciences. The Biosecurity Board will address issues concerning both cultured and wild stocks in the state's waters.

The year 2001 also saw the continuation of the annual Rhode Island Aquaculture Conference. This year the Second Annual Southern New England Aquaculture Conference and 6th Annual Rhode Island Aquaculture Conference were held on the campus of the University of Rhode Island. A conference planning committee made up of representatives from Connecticut, Massachusetts, New York and Rhode Island invited speakers from the four state region. This conference is continuing the creation of a regional approach in southern New England. Planning has also begun on the Northeast Aquaculture Conference and Expo (NACE), to be held November 16 and 17, 2002 in Warwick, RI. This conference will bring together aquaculture interests from Maine to New Jersey. The NACE '02 is a continuation of the Maine conference begun in 1999 which now combined with the Southern New England Aquaculture Conference will bring together the whole New England region.

All in all it was a building year for aquaculture in Rhode Island. While production was down at the farm level, sales were up at new and existing aquaculture related industries which continued to conduct business in Rhode Island and to export to other states and nations. This increase in sales in related industries is more impressive considering one company chose not to participate in this survey this year. At the universities research and outreach continues to bring in significant amounts of money and to serve industry. The traditional fishing industries and the nascent aquaculture industry are coordinating efforts to reduce conflict. The regulatory agencies involved in this arena are streamlining permitting. More importantly the agencies are becoming more aware of the needs of the seafood industry.

Farm Production

In the year 2001, farm gate value of aquaculture production fell 4.7% (Table 1) from last year's levels (all figures are for shellfish production only). This decrease can be attributed to a slow economy in the first half of the year, followed by a significant decline in restaurant sales after the September 11 attacks. This decrease (Graph 1) equated to $14,979. All farm income in Rhode Island was entirely due to shellfish culture. A number of new leases that were permitted in the last three years began production this year, thus contributing to the overall production numbers. Last year production was attributed to just eight of the fifteen leases. This year, however, 12 of 18 leases produced product. In the year 2001, the number of leases grew to 18 (Graph 4).

Table 1

Year	Percent Change in Farm Gate Value from Previous Year
1995-1996	9.6%
1996-1997	72%
1997-1998	13%
1998-1999	20%
1999-2000	47%
2000-2001	-4.7%

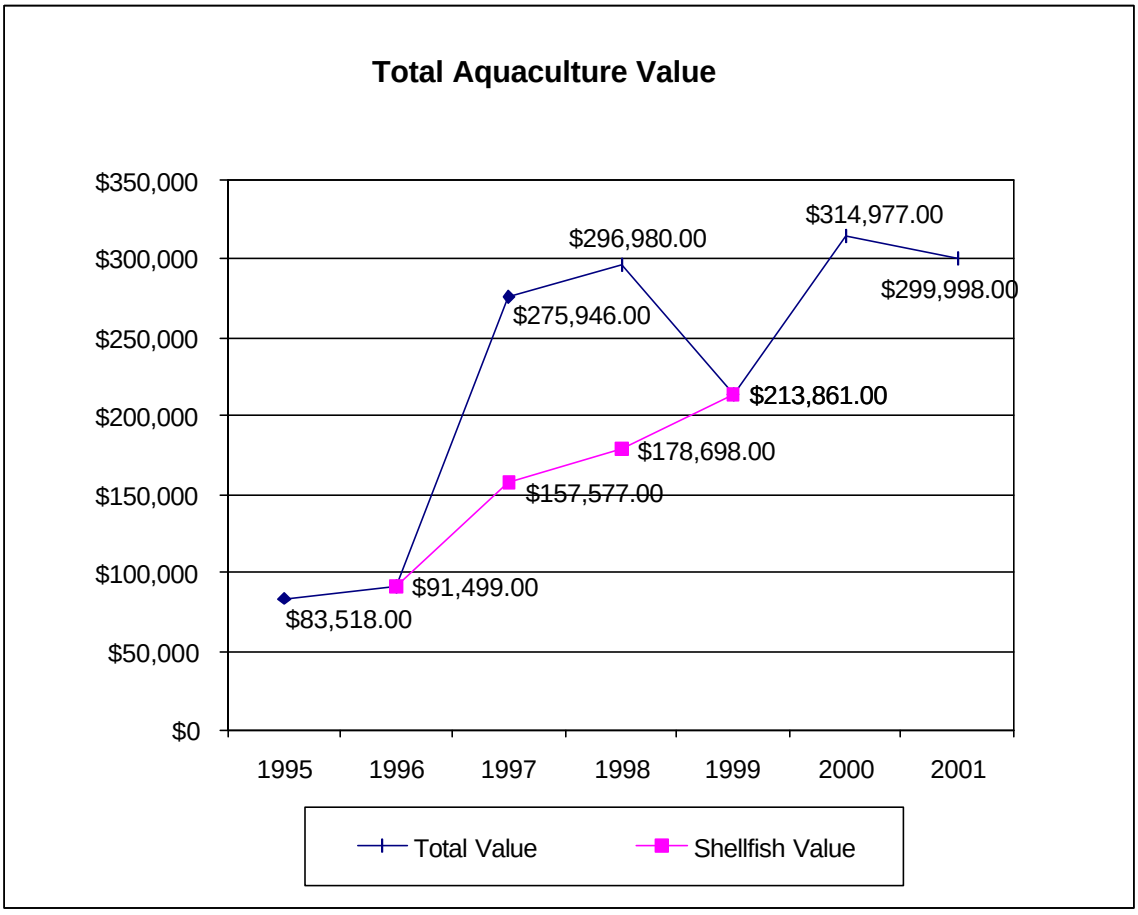
Table 1 shows the percentage change of the farm gate value of aquaculture shellfish production in Rhode Island. See Graph 1 for overall production figures.

Rhode Island aquaculture production in 2001 can be attributed to just two major species (Graphs 2 & 3). The production of American oysters and the hard clam (or quahog) made up almost 100% of the production. Graph 2 reflects the relative production numbers between the two species. This year the production of quahogs has increased by 36%, while the production of oysters has declined 1%. Graph 3 shows the relative values of the two species being cultured. The value of oysters, approximately $275,559, made up the majority of the state's production. Quahog production was worth approximately $24,439.

The number of aquaculture leases in Rhode Island waters increased in 2001. The number of farms grew from 13 to 18. The total tidal area under lease is now 51.5 acres, up from 30 acres in 2000, an increase of 72%.

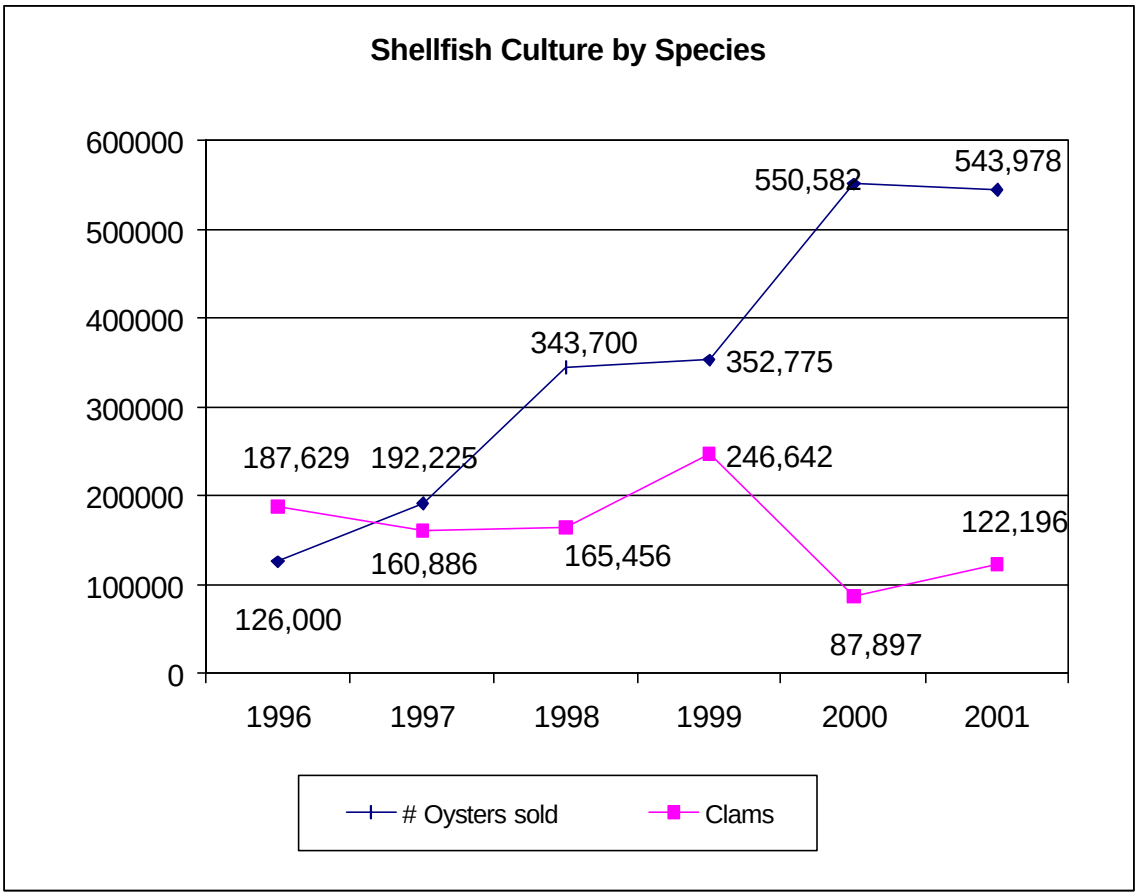
The number of employees on Rhode Island aquaculture farms declined slightly in 2001. These figures show that there are 11 full time and 12 part time employees. Additionally, there were also 3 part time seasonal people employed.

Graph 1



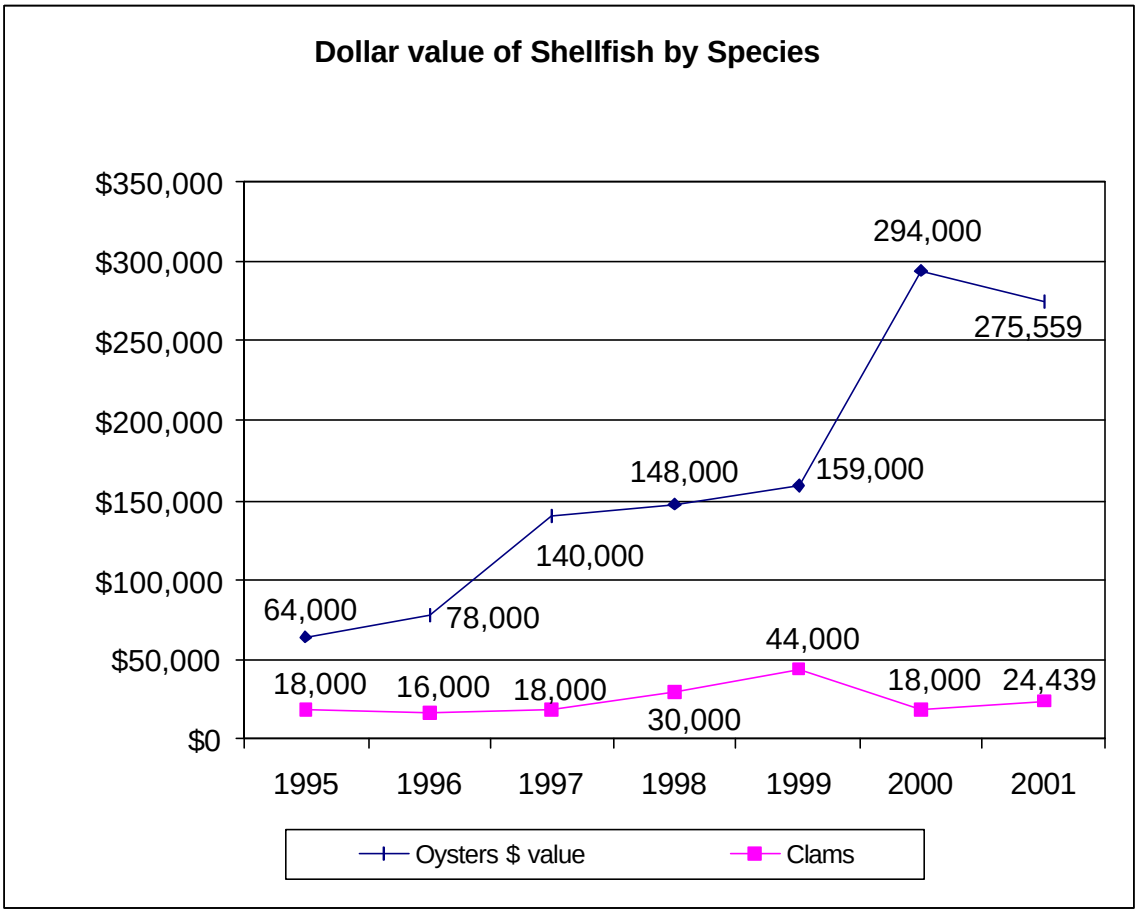
In 2001, production of shellfish decreased for the first time in six years. The decrease of $14,979 is a 4.7% decline from the previous year's production. The total value indicated for the years 1997 and 1998 includes a retail ornamental finfish operation that was in business for those two years only.

Graph 2



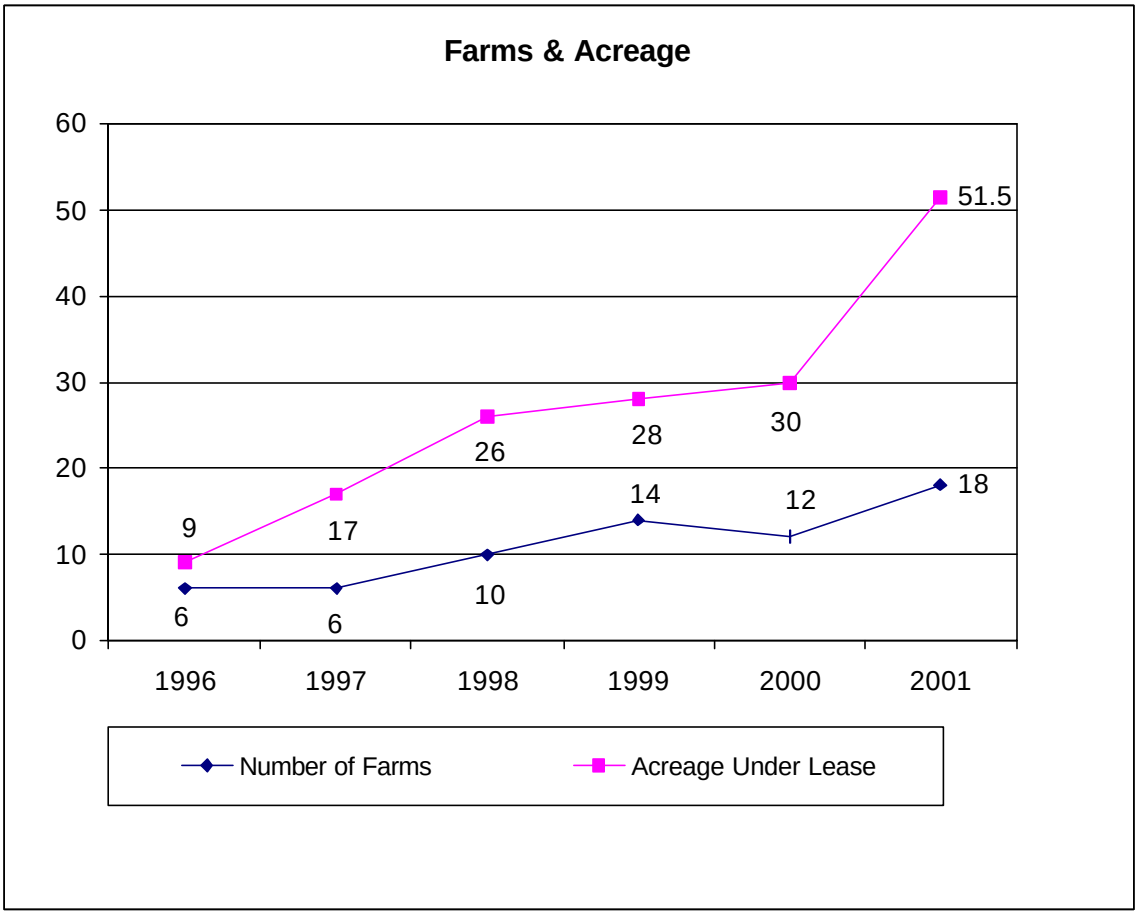
The American oyster is the dominant species cultured in Rhode Island waters. Slightly more than 543,000 sold in 2001, a decrease of 1% from 1999. The culture of quahogs has increased with approximately 122,196 being produced in 2001, an increase of 39% from 2000.

Graph 3



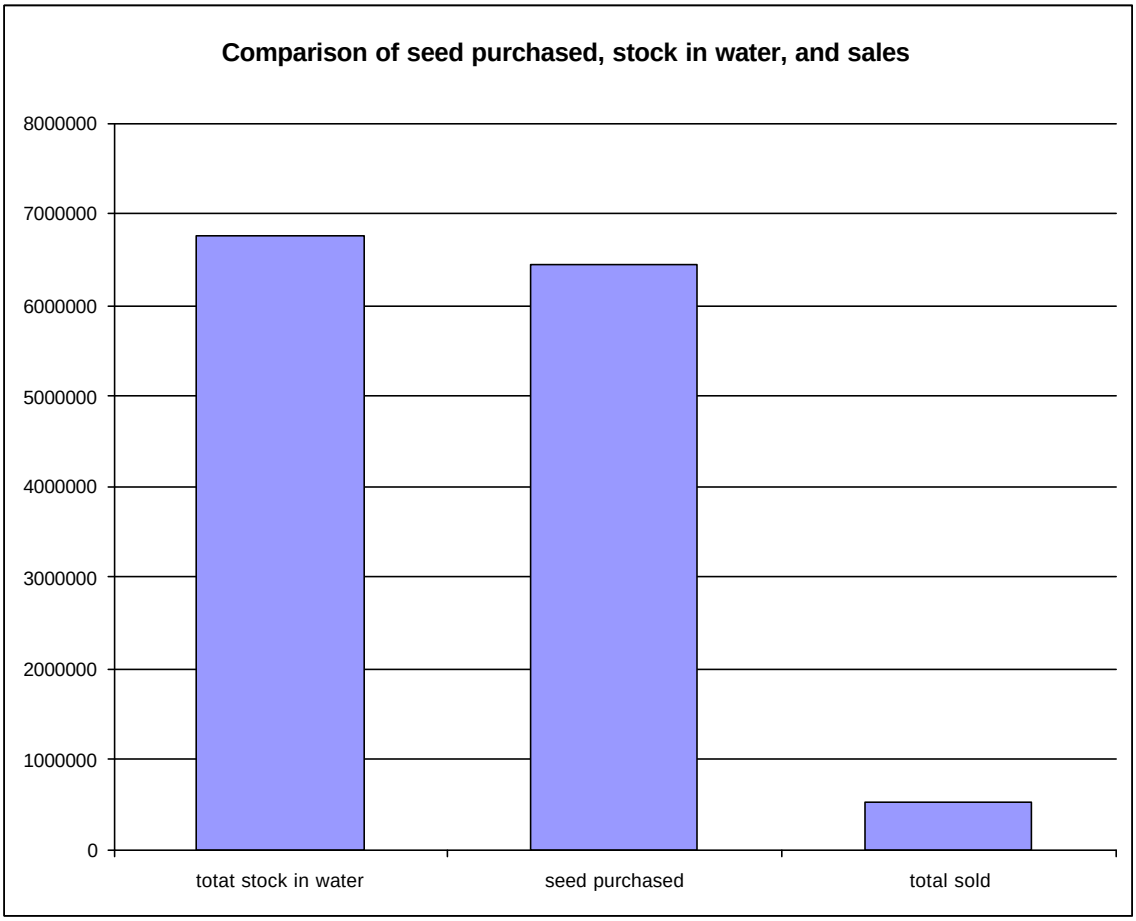
Graph 3 indicates the relative value of the shellfish production in Rhode Island for 2001. The decrease in value of oysters from 2000 was 6.3%. The increase in value of quahogs was 36%.

Graph 4



There was an increase of four leases during 2001 and an increase of acreage under lease of 21.5 acres. The totals for 2001 are 51.5 acres under cultivation and 18 permit holders (not including commercial viability, educational and research permits).

Graph 5



This graph shows the relationship between seed bought in a single year, the number of animals in the water on aquaculture farms and the numbers of shellfish sold. This graph indicates possible future animals available for harvest in coming years. Mortality of 40-50% per year is not uncommon in the shellfish industry.

Aquaculture Related Industries

It is the other aquaculture related industries in Rhode Island that are the largest contributors to the state's economic bottom line. These industries include distribution of aquaculture product (fish and shellfish), and the manufacturing of aquaculture products to be used on farms. There are a number of small privately held companies in the state that fit into this category. These companies do a gross total of $3,900,000 in business in the state, an increase of 26%. This increase is especially impressive when the fact that one of the companies doing business in the state who contributed to this report last year declined to contribute to this report this year. These companies employ 16 full time and one part time employee. Not only do these companies serve local and regional farmers, but they also export internationally.

The State of Rhode Island his home to two universities that conduct aquaculture education and research; the University of Rhode Island and Roger Williams University. Each is recognized for both quality education and research. This recognition translates into grant monies flowing into the state in order to conduct aquaculture related research. The total of external funding brought into the state for aquaculture research and education is $1,313,654, a 31% decrease from 2000. Not included in the income figures is the tuition and housing expenditure of 78 undergraduate students in the URI Fisheries and Aquaculture Technology program.

The two universities employ 40 professors or professional staff who conducts aquaculture related research or teaching. There are 19 graduate students who are working in aquaculture related areas. The universities have a greater role than that of research and education though; they are also there to help businesses in the state acquire the knowledge and expertise required to remain competitive in the international arena of aquaculture.

Regulatory Agencies

The Coastal Resources Management Council (CRMC), Department of Environmental Management (DEM) and the Department of Health (DOH) continue to work closely together during the year. The staff members who deal with the day-to-day regulations concerning

aquaculture in Rhode Island continue to work toward streamlining the permitting process. The staffs are also active in continuing to monitor the industry and are able to respond quickly to unforeseen contingencies that may arise.

Possibly the most important development in Rhode Island aquaculture during 2001 was the rewriting of all aquaculture regulations by DEM. This was a collaborative effort led by DEM which included the aquaculture industry, the fishing industry and regulatory agencies. All meetings were open to the public and there was unprecedented participation. The new regulatory framework was hammered out during a series of meetings. Credit is due to all of the participants who gave their time to ensure this effort was productive. The DEM director, Jan Reitsma, receives special kudos for his work during this process. At this time, pending legislative approval, Rhode Island will be a leader in innovative and effective regulation of the aquaculture industry.

During 2001 the CRMC Biosecurity Board was formed. The seven member board is charged with assisting and advising the Coastal Resources Management Council on issues concerning disease importation, federal regulations pertaining to aquatic disease issues and importation of non-indigenous species into Rhode Island waters. The board is made up of representatives from CRMC, the state veterinarian, a specialist in public health from the Department of Health, the RI Marine Fisheries Council, DEM Division of Fish & Wildlife, the RI aquaculture industry and the Department of Fisheries, Animal & Veterinary Sciences, URI. The biosecurity board will address issues concerning both cultured and wild stocks in the states waters.

Within CRMC the working group on aquaculture and fisheries did not meet this year due to the over whelming number of meeting related to the restructuring of the DEM fishery and aquaculture regulations. Work has continued on the group's charting project. The University of Rhode Island Cooperative Extension Service has generously supported the efforts to put the working group's efforts on charting the marine used of Rhode Island waters on a web site. The maps can be accessed at http://narrbay.org. The charts have already proven their worth, and prospective aquaculture applicants are encouraged to review them during the site selection process.

In November, at the 2nd Southern New England Aquaculture Conference it was announced that 1.5 million dollars, secured through the efforts of Senator Jack Reed, had been appropriated for planning and advancement of aquaculture in Rhode Island. The project has been entitled the "Rhode Island Aquaculture Initiative" and should begin to positively affect the state of aquaculture in Rhode Island in 2002. The grant will be used to fund projects in the following areas:

- A series of large research grants in areas of direct application to the Rhode Island aquaculture industry.
- A series of mini-grants to help new entrants enter the industry and to encourage existing farmers to diversify into new areas. The grants will fund the purchase of seed and material while the farmer contributes sweat equity.
- To fund two extension positions, one in shellfish aquaculture at Roger Williams University and the other a finfish specialist at the University of Rhode Island. Both positions will work in growing the existing aquaculture industry and to grow the industry through diversification into new species.
- To continue funding for projects that are underway, the charting project started by the CRMC working group will be continued, the Roger Williams University shellfish restoration project initially funded by the U.S. Department of Commerce will receive continued funding, and support the feasibility study/business plan creation for an Aquaculture/Marine Bio-Technology Park in Rhode Island.

The grant was being administered by CRMC with project management being carried out by the Rhode Island Sea Grant, The University of Rhode Island and Roger Williams University. Priority guidance and operational supervision is provide for by an executive committee composed of aquaculture industry representatives, regulatory officials, researchers and other experts. This collaboration between federal, state, industry and academia is a first for the State of Rhode Island. It is the intent of all concerned with the administration of this grant that this

opportunity will not be wasted and the maximum use of the money possible will go directly to help increase the aquaculture industry in Rhode Island. The web page for this initiative can be accessed at: http://seagrant.gso.uri.edu/research/rhodyaquaculture/rhodyaquaculture.html.

An e-mail information service was continued during the year. The people on this list receive regular, sometimes daily, articles gleaned from internet sources by the aquaculture coordinator's office. This service helps to ensure that all of the participants are up to date on issues related to the seafood industry.

The 6th Annual Rhode Island Aquaculture Conference was held this year in conjunction with the 2ed Annual Southern New England Aquaculture Conference. The combined meeting was held at the University of Rhode Island Bay campus. There were sessions on education, marketing, management issues, marine culture, and freshwater culture. A panel made up of representatives of the four states invited the conference's speakers.

A wide range of organizations in the four states sponsored the conference. From Rhode Island a partial list includes the RI Legislative Commission of Aquaculture; The University of Rhode Island; RI Coastal Resources Management Council; Roger Williams University; RI Narragansett Bay Commission; RI Sea Grant; URI Cooperative Extension and the URI Agriculture Experiment Station. A partial list of sponsors from Massachusetts include Massachusetts Sea Grant, MIT; Massachusetts Sea Grant, WHOI; Barnstable County (Mass) Cooperative Extension; Massachusetts Department of Food & Agriculture; Western Massachusetts Center for Sustainable Aquaculture; Northeastern Massachusetts Aquaculture Center and the Southeastern Massachusetts Aquaculture Center. From Connecticut the CT Sea Grant and CT Cooperative Extension were sponsors. From New York the conference had support for the NY Sea Grant and Cornell Cooperative Extension. All of these organizations and growers in the four-state region and New Hampshire were very generous in their support of this first regional conference. All of the participants agree that this conference was a first step towards building a coalition between the four states. This hoped for collation is taking place. In November 2002 the first truly regional conference, The Northeast Aquaculture Conference and Expo (NACE), will take place in Warwick, R.I.

During the past year, the CRMC addressed the potential threats posed by non-indigenous species to Rhode Island's aquatic environments and the economic activities they support by amending the CRMP at § 300.11. As a result, the CRMC now requires all applicants proposing to culture non-indigenous species in Rhode Island to design a protocol for review and approval by the Bio-Security Board prior to the issuance of an assent. Protocols must ensure that no accidental releases of non-indigenous species into the state's waters can occur. In addition, any proposed modification to the permitted operation must also be reviewed and approved by the Bio-Security Board before an assent modification can be issued. Finally, the issuance of a permit under these stipulations can be revoked if a release of non-indigenous species occurs during the term of the assent.

The CRMC also addressed the threat of non-indigenous species to Rhode Island this past year via membership on the Northeast Regional Panel of the federal Aquatic Nuisance Species Task Force. The ANS Task Force, as established by the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA), represents a nationwide coordinated response to non-indigenous aquatic nuisance species. The ANS Task Force achieves its goals of preventing future introductions, controlling current infestations, and mitigating impacts, through regional coordination. The Great Lakes Panel was the first regional panel established by NANPCA in 1990 in response to the introduction and spread of the zebra mussel throughout the Great Lakes region.

The National Invasive Species Act of 1996 amended NANPCA to, among other things, promote the formation of additional regional panels. The Northeast Regional Panel was approved by the ANS Task Force in July, 2001. The Panel includes representatives from New York, the New England states, and the Canadian Provinces of New Brunswick and Nova Scotia. An invitation to join the Panel has also been extended to the Province of Quebec. The CRMC currently co-chairs the Panel's Policy and Legislation Committee, and is helping to lead the Panel's efforts toward strengthening federal, state, and provincial laws and regulations to better protect Rhode Island's and others aquatic resources from non-indigenous species.

Conclusion

It has been an interesting year for aquaculture in Rhode Island. There was a decline in the farm production of shellfish, even though there was an increase in the number of farms. This decrease in sales was due to a soft economy in the first part of the year which was exacerbated by the decline in restaurant sales after September 11. The basis for continued growth will be the new farms coming on line in the next few years. The industry continues to be totally dependent on two species of shellfish for its entire crop. It would be prudent if there could be movement towards introducing new species. Two oyster diseases, MSX and Dermo, continue to have an effect while another disease, JOD, looks like it might increase the disease related mortality. An emerging disease concern is the quahog parasite QPX which affects the wild resource as well as cultured. During the coming years we will be encouraging the use of alternative species for aquaculture production.

The emergence of a regional coalition of the New England states is a positive step. History and the natural environment link the New England region. This common thread makes the joining of the region a natural progression which will further the industry in this unique area.

The aquaculture-associated industries within Rhode Island have contributed to the economic well being of the state. As the industry grows, in Rhode Island, the nation, and the world, this sector of the industry will continue to contribute economically.

The universities continue to be centers of excellence in the field of aquaculture. The University of Rhode Island employs internationally known and respected researchers in the field. Roger Williams University continues to compliment the efforts of URI in the aquaculture arena and is growing into a center of excellence on it's own. Both universities contribute greatly to the state's economic bottom line and to supporting a viable aquaculture industry.

The continued cooperation of the regulatory agencies in streamling the permitting process, while bringing the stakeholders into the process, will help to reduce conflict and further the

seafood industries goals of a continuing viable industry. The first tangible progress in this area has produced the charting project, which has already had an impact. Continued effort in this area will hopefully produce tangible products; however, an intangible product of improved communication between the various sectors in this industry has already been realized.

Caveats

Harvest figures for this report came from the "Annual Report of Aquaculture in Rhode Island 2001" compiled by Mr. A. Ganz at the Coastal Fisheries Laboratory of the RI DEM, Division of Fish and Wildlife. This report is produced yearly from reports supplied by the individual farmers who hold "Special Permits for Aquaculture" from RI DEM. All reports are taken at face value and no further queries are made of the farmers.

Monetary figures for this report were calculated by averaging an estimated yearly average price from multiple sources. This figure was then multiplied by the numbers reported by growers in the yearly DEM report to arrive at the figures used in this report.

Figures from the aquaculture associated industries came from the principals involved in these privately held companies. The figures cited are for gross sales of aquaculture related products.

The statistics cited for the universities were supplied by the universities.

Acknowledgments

Thanks to Mr. A. Ganz, RI DEM; Mr. G. Fugate, RI-CRMC; Dr. R. Rheault, Spatco Inc.; Mr. R. Silkes, American Mussel Harvesters Inc.; Mr. D. Bouchard, Atlantic Aquaculture Supply; Dr. T. Scott, Roger Williams University; Dr. M. Rice, University of Rhode Island, and all of the aquaculture lease holders for their help in putting this report together.

Appendix A

R.I. DIVISION OF FISH AND WILDLIFE
COASTAL FISHERIES LABORATORY
1231 SUCCOTASH ROAD
WAKEFIELD, RI 02879
January 2002

ANNUAL REPORT OF AQUACULTURE IN RHODE ISLAND 2001

by
Arthur R. Ganz
Aquaculture Coordinator
D.E.M.
Division of Fish and Wildlife

Summary:

Total number of permitted aquaculture facilities: 19
- Operations in production: 14
- Operations in terminated: 2
- Operations under C.R.M.C. permit review: 1

Number of permitted experimental/research/educational aquaculture facilities: 5

Number of acres leased for aquaculture: 56.3

Reported annual harvest from aquaculture:

Shellfish:

- American Oysters: (Adult) 407,218 count
- European Oysters: 4,400 count
- Bay Quahogs: (adult) 114,850 count
- Bay Quahogs: (seed) 560,000 count

This amount was grown and sold by 10 aquaculturist
Production from three culture operations have not reached market size and one reported no production.

No finfish were cultured for sale in 2001.

Reported Employment:

Full-time employees	13
Part-time seasonal	5
Part-time year-around	9
Volunteers	3 (does not include Students)