

1982

## **The Hard Clam Fishery Problems and Approaches**

Andre C. Kvaternik

William D. DuPaul

Follow this and additional works at: <https://scholarworks.wm.edu/vimsbooks>



Part of the [Aquaculture and Fisheries Commons](#)

---

CPA  
File  
107  
c.2

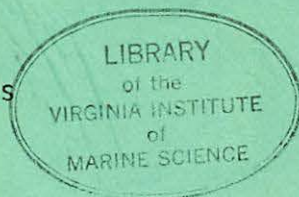
REPORT OF  
WORKSHOP ON CHESAPEAKE BAY FISHERIES STATISTICS  
Fredericksburg, Virginia  
July 12-13, 1982

Chesapeake Biological Laboratory  
Center for Environmental and Estuarine Studies  
University of Maryland

Chesapeake Research Consortium

JAN 6 1983

Tidal Fisheries Division  
Tidewater Administration  
Maryland Department of Natural Resources



Virginia Institute of Marine Science  
The College of William and Mary

Virginia Marine Resources Commission

L. Eugene Cronin, Editor

October 1982

CRC PUBLICATION NO. 107

CONTENTS

	<u>Page</u>
<u>PREFACE</u> . . . . .	1
<u>SUMMARY AND RECOMMENDATIONS</u> . . . . .	5
OPENING REMARKS	
<u>James E. Douglas, Jr.</u> . . . . .	9
<u>W. P. Jensen</u> . . . . .	11
FISHERIES OF CHESAPEAKE BAY	
<u>L. Eugene Cronin</u> . . . . .	13
THE VALUES OF COMMERCIAL AND RECREATIONAL FISHERIES RESOURCE STATISTICS	
<u>Paul J. Anninos and Howard King</u> . . . . .	19
THE CHESAPEAKE BAY FISHERIES A SCIENTIFIC PERSPECTIVE	
<u>Herbert M. Austin</u> . . . . .	23
THE CHESAPEAKE BAY FISHERIES SOCIO-ECONOMIC PERSPECTIVE	
<u>Mark M. Bundy</u> . . . . .	30
PERTINENT STATISTICAL DATA FOR THE MANAGEMENT OF MARYLAND AND VIRGINIA FISHERIES	
<u>Philip W. Jones and Joseph Loesch</u> . . . . .	40
A STUDY OF THE PRESENT STATE OF OYSTER STATISTICS IN CHESAPEAKE BAY AND SUGGESTED REMEDIAL MEASURES	
<u>George E. Krantz and Dexter S. Haven</u> . . . . .	44
THE HARD CLAM FISHERY PROBLEMS AND APPROACHES	
<u>Andre C. Kvaternik and William D. DuPaul</u> . . . . .	53
THE SOFT CLAM FISHERY PROBLEMS AND APPROACHES	
<u>Roy Scott</u> . . . . .	60
FINFISHERIES PROBLEMS AND APPROACHES	
<u>John V. Merriner and Harley J. Speir</u> . . . . .	62
THE BLUE CRAB FISHERIES IN THE CHESAPEAKE BAY PROBLEMS AND APPROACHES	
<u>W. A. Van Engel, Chris Bonzek and Ray Dintaman</u> . . . . .	69

A SUMMARY OF PRESENT FISHERIES STATISTICS  
PROGRAMS IN MARYLAND AND VIRGINIA  
Paul J. Anninos and Michael Burch . . . . . 74

STATUS OF FISHERIES MANAGEMENT AND FISHERIES  
STATISTICS IN CHESAPEAKE BAY  
B. J. Rothschild and Philip W. Jones . . . . . 96

PARTICIPANTS . . . . . 109

THE HARD CLAM FISHERY  
PROBLEMS AND APPROACHES

by

Andre C. Kvaternik  
and  
William D. DuPaul

Virginia Institute of Marine Science  
School of Marine Science  
College of William and Mary  
Gloucester Point, VA 23062

The hard clam, Mercenaria mercenaria (Linne, 1758), is a euryhaline bivalve found along the eastern and Gulf coasts of North America (Abbott 1954; Carriker, 1961; Wass, 1972, Miller et al., 1975). It is an important commercial bivalve along the Atlantic Coast (Belding, 1912; Tiller et al., 1952; Andrews, 1970; Castagna and Haven, 1972; McHugh, 1972, 1977, 1982; Miller et al., 1975). Hard clams are consumed in a wide variety of ways, with the larger clams (>80 mm) being used in chowder and the smaller and more succulent littlenecks (<60 mm) ("necks") and cherrystones (61-80 mm) ("cherries") being eaten either steamed or raw on the half shell.

The fishery for hard clams in the Chesapeake Bay is presently only understood on a broad scale. Concentrated in the lower Chesapeake Bay and the seaside lagoons of the Eastern Shore, annual landings of hard clams in Virginia have decreased from a high of 2.4 million pounds of meats in 1965 to a low of 0.4 million pounds in 1978. The landings for 1979-1981 show only a slight upward trend. Maryland annual landings of hard clams peaked at 794,000 pounds of meats in 1969 and reached a low of 19,700 pounds in 1979. Total landings and number of permits are the only catch and effort data collected for the fishery. Therefore any analysis using catch per unit effort as a measure of abundance is not possible. Haven et al. (1973) computed catch per unit effort for the Virginia fishery using commercial data. Effort was measured in number of licenses and catch per unit effort in pounds per license. This did produce a curve similar in shape to the Schaefer logistic function (Schaefer, 1954), but is difficult to interpret because the nominal unit of effort used in this analysis (number of licenses) is far removed from real fishing effort. Measures of real fishing effort for patent tong harvesters ideally should be expressed in hours fished/day, but it is unrealistic to believe this

effort data could be collected. A unit of real fishing effort expressed in boat-days could realistically be collected and would provide a measure of catch/boat/day, a more accurate estimate of catch per unit effort than pounds/license.

Patent tongs are the primary harvesting gear used on the Western Shore of the Bay. The majority of the Western Shore clammers participate in the summer James River fishery and then return to Poquoson Flats, Mobjack Bay, or the York River during the remainder of the season. There are no accurate means of determining the catch/boat/day from the information presently collected. Average catch/boat/day for each of these areas may or may not be declining, but there is no way at present to ascertain this.

On the Eastern Shore, accurate determination of catch is also difficult. Recreational harvesting by signing and clam rakes is extensive (Castagna and Haven, 1972) and does not facilitate accurate estimation of catch. Signing is a method of harvesting in which clams are located on the bottom by the use of a person's feet, and then removed by a clam pick. Effort determination in the recreational fishery is difficult at best. The recreational fishery is exempt from licensing laws because they harvest only for household use (Virginia Code §§ 28.1-120(8)). Thus, this portion of the harvest is excluded from reported landings.

Data collected for the Virginia clam fishery is obtained from surveying buyers. The resulting statistics give gross characteristics of the fishery, but do not represent 100% of the landings and do not reflect fishing effort. Total landings may increase or decrease, but this may be a reflection of increased or decreased effort. Less than one hundred percent of the landings is reported because contact cannot be made with every buyer. The only area where 100% of the landings are reported is in the James River. This is due to mandatory reporting of polluted clams harvested in this fishery. All boats unload their catch at one location, making data collection relatively easy (Kvaternik, in prep.).

While recognizing today's current trends towards deregulation of business, the only other accurate alternative to the present system of data collection is one that relies more heavily on contribution of the seafood industry, and the clam buyer in particular. Buyers could provide the elusive catch/boat/day figure that could give some indication of stock size and recruitment in heavily fished

areas. Furthermore, a breakdown of the clam catch into its three market sizes (littlenecks, cherrystones, and chowders) is also needed. This could provide a monitor of recruitment success, albeit crude. The lack of such data presents a problem when trying to conduct any economic analysis because of the varying ex-vessel prices assigned to each of the three grades (Kvaternik and DuPaul, in prep.) (Table 1). Littleneck and cherrystone clams bring a much higher ex-vessel price than chowders. However, this cannot be discerned from the published statistics (Virginia Marine Resources Commission, 1981). The disaggregation of the landings data into grades would allow more accurate economic analyses of ex-vessel price fluctuations in response to changes in supply (Personal communication, Oral Capps, Jr., Dept. of Agricult. Economics, VPI and SU, Blacksburg, Virginia, 16 June 1982).

An additional point must be made regarding underreporting of catch, which is a problem common to most commercial fisheries. Published statistics report the catch during one three month period in the James River to be 30,000 pounds less than the actual harvest (Table 1). The amount of underreporting for the entire year in this fishery can only be estimated at 30-35%. Similar arguments can be made for other species which bring different ex-vessel prices depending on product grade and quality. Underreporting may become a critical factor if revenue sharing measures now before Congress allocate funds to states based on reported commercial fisheries landings and values. States must act now to collect accurate landings information.

Another possible method of catch estimation is through the use of a random sample survey of clammers (similar to the Maryland method of estimating blue crab catch). This methodology has not been applied to any of the Virginia fisheries but should work if the sampling strategy is designed to reach a representative sample of the harvesters. This would provide an estimation of total catch and proportion of each grade. This would require much greater automated data processing facilities than exist at present. Either of these two methods will require a greater commitment via financial resources or legislation from the General Assembly.

The hard clam fishery is small when compared to other Virginia fisheries but the problems that exist in the collection of catch statistics are common to all fisheries. The situation of incomplete fisheries statistics is one which

TABLE 1. COMPARISON OF ACTUAL LANDINGS WITH PUBLISHED STATISTICS FOR HARD CLAMS IN THE JAMES RIVER, MAY THROUGH AUGUST 1981

	Clams	#/bu.	bu.	Pounds of Meats (bu. X 8)	Percent of Total Landings	Ex-vessel Value (dollars)	Price per Pound (dollars)
Necks	8,573,431	500	17,147	137,175	69.32	428,672	\$3.1250
Cherries	2,245,213	300	7,484	59,872	30.26	112,261	\$1.8750
Chowers	18,169	175	104	831	0.42	546	\$0.6562
Totals	10,836,833		24,735	197,878	100.00	541,479	

Virginia Marine Resources Commission published statistics - May through August 1981

	Pounds of Meats	Ex-vessel Value	Price Per Pound (dollars)
	164,528	442,524	\$2.6896

Weighted price per pound unit (calculated from actual landings) =

\$2.7364



can be remedied by a definite commitment from the state, followed by an appropriation of resources to carry out the task. Only through this renewed commitment can we get the broad indication of stock size and recruitment needed to make intelligent decisions regarding management of the fishery.

### ACKNOWLEDGEMENTS

This work is the result of a master's thesis by Andre Kvaternik. The research was sponsored by the Office of Sea Grant, NOAA, U.S. Department of Commerce, under Grant Numbers NA-81AA-D-00025 and NA-82AA-D-00025 and the Virginia Sea Grant Program through the VIMS Marine Advisory Service, Project Number A/EP-1. The U.S. Government is authorized to produce and distribute reprints for governmental purposes, notwithstanding any copyright that may appear hereon. Thanks to Eileen Cullison and Elizabeth Gillman for typing draft and final copies.

Literature Cited

- Abbott, R. T. 1954. American Seashells. D. Van Nostrand Co., Inc., New York, NY 541 p.
- Andrews, J. D. 1970. The Mollusc Fisheries of Chesapeake Bay (USA). pp. 847-856  
In: Proc. of the Symposium on Mollusca held at Cochin-Part III, Mar. Biol.  
Assoc. India.
- Belding, D. L. 1912. A report upon on the quahaug and oyster fisheries of  
Massachusetts, including the life history, growth, and cultivation of the  
quahaug. Dept. Conserv., Commonwealth Mass., Wright and Potter Printing  
Co., Boston, MA. 134 p.
- Carriker, M. R. 1961. Interrelation of functional morphology, behavior, and  
autecology in early stages of the bivalve Mercenaria mercenaria. J. Elisha  
Mitchell Sci. Soc. 77: 168-241.
- Castagna, M., D. S. Haven. 1972. The hard clam industry. pp. 64-82 In: A Study  
of the Commercial and Recreational Fisheries of the Eastern Shore of Virginia,  
Accomack and Northampton Counties. V. G. Burrell, M. Castagna, R. K. Dias,  
eds. Special Report in Applied Marine Science and Ocean Engineering No. 20,  
Virginia Institute of Marine Science, Gloucester Point, VA 119 p.
- Haven, D. S., J. G. Loesch, J. P. Whitcomb. 1973. An investigation into commercial  
aspects of the hard clam fishery and development of commercial gear for the  
harvest of molluscs. Final Report, Contract 3-124-R with the Virginia Marine  
Resources Commission, for the National Marine Fisheries Service. Virginia  
Institute of Marine Science, Gloucester Point, VA. 119 p.
- Kvaternik, A. C. Analysis of population and price aspects of the Virginia hard  
clam (mercenaria mercenaria) fishery. Master's thesis, College of William  
and Mary, Williamsburg, VA. 104 pp.
- Kvaternik, A. C., W. D. DuPaul. A weighted price unit for use in fishery economics.  
In preparation.
- McHugh, J. L. 1972. Marine fisheries of New York State. Fish. Bull. 70:  
585-610.
- McHugh, J. L. 1977. Limiting factors affecting commercial fisheries in the  
middle Atlantic estuarine area. pp. 149-169 In: Estuarine Pollution Control  
and Assessment. Proceedings of a Conference. Vol. 1 U.S.E.P.A., Office  
of Water Planning and Standards, Washington, D.C.
- McHugh, J. L., M. W. Sumner, P. J. Flagg, D. W. Lipton, W. J. Behrens. 1982.  
Annotated bibliography of the hard clam (Mencenaria mencenaria). NOAA  
Technical Report NMFS SSRF-756, U.S. Dept. of Commerce, NOAA, Washington, D.C. 845 pp.
- Miller, W. S., E. M. Wallace, C. N. Schuster, R. E. Hillman. 1975. Hard clam, the  
gourmet's delight. Marine Resources of the Atlantic Coast, Leaflet No. 14,  
Atlantic States Mar. Fish. Comm., Washington, D.C. 8 p.
- Schaefer, M. B. 1954. Some aspects of the dynamics of populations important to the  
management of commercial marine fisheries. Inter. Amer. Trop. Tuna Comm.  
Bull. 1(2): 27-56.
- Tiller, R. E., J. B. Glude, L. D. Stringer. 1952. Hard clam fishery of the Atlantic  
coast. Comm. Fish. Rev. 14(10): 1-25.
- Virginia Marine Resources Commission. 1981. Commercial fisheries statistics, May  
through September, 1981. Virginia Marine Resources Commission, Newport News, VA. 4p.
- Wass, M. L. 1972. Phylum mollusca. pp. 122-129 In: A check list of the biota of  
lower Chesapeake Bay, M. L. Wass, compiler. Special Scientific Report No. 65,  
Virginia Institute of Marine Science, Gloucester Point, VA. 290 p.