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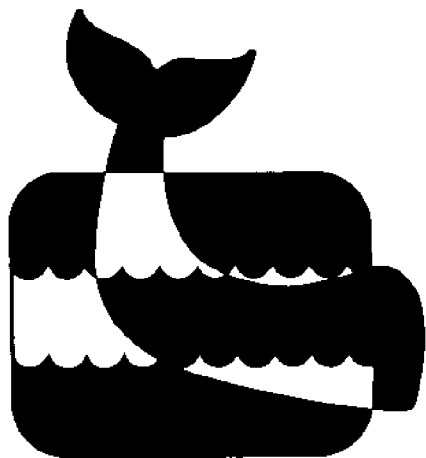
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AGE AND GROWTH OF THE PINKNECK CLAM SPISULA POLYNYMA

IN THE BERING SEA. A Progress Report

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Sea Grant Report 77 - 12
October 1977

ALASKA SEA GRANT PROGRAM
University of Alaska
Fairbanks, Alaska 99701

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ACKNOWLEDGEMENTS

The authors wish to thank Mr. Max Hoberg for his assistance with the collection of the material on board the F/V Smaragd. We also wish to thank the crew and other scientific personnel on the F/V Smaragd for their aid in the collections and Ms. Phyllis Shoemaker for her assistance in the laboratory. This report is the result of research sponsored by the Alaska Sea Grant Program, cooperatively supported by NOAA Office of Sea Grant, Department of Commerce, under Grant 04-7-158-44006 and by the University of Alaska with funds appropriated by the State of Alaska.

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INTRODUCTION

The clam harvest in the United States is now 40 to 50 million pounds short of the market demand (Jones, 1977). A search by industry is currently under way to find a new subtidal source of clams harvestable by mechanical dredging gear. Alaska's clams are one of the state's important untapped fisheries resources (Feder and Paul, 1974; Paul and Feder, 1976), and coastal Alaska is one of the three areas now under consideration as a source for the extensive needs of the clam industry.

It was proposed at the Alaska Clam Fisheries Development Meeting in Juneau (Jones, 1977) that a clam survey be made in the southeastern Bering Sea in the summer of 1977 utilizing an east coast subtidal clam dredge. The dominant clam of the area is *Spisula polynyma*, commonly called the pinkneck or red neck clam (Feder, unpub. data from Outer Continental Shelf Environmental Assessment Program, OCSEAP, surveys in the Bering Sea; Paul and Feder, 1976; Sam Stoker, Institute of Marine Science, unpub. data). This clam is closely related to the east coast surf clam *S. solidissima*, which was the dominant species used in the production of U.S. canned clam products (Yancy and Welch, 1968).

Spisula polynyma is a large bivalve found in intertidal and subtidal Alaska waters. Previous literature on this clam is restricted to a geographic study by Chamberlin and Stearns (1963), and a report on the growth and size-weight relationships of intertidal pinknecks in Prince William Sound (Feder, et al., 1976.) Growth data is available for subtidal Cook Inlet clams (Feder, unpub. OCSEAP data). No published work is available on the density or biology of subtidal Bering Sea pinkneck clams.

OBJECTIVE

The major objective of this report is to provide preliminary information on the growth of *Spisula polynyma* from the southeastern Bering Sea. Additional information on the biology of this clam will be presented in a final report to be submitted to the Alaska Sea Grant Program. Catch per unit effort data for the survey will be made available by the National Marine Fisheries Service.

METHODS

Specimens were collected in July and August 1977 from the F/V Smaragd with a modified east coast hydraulic clam dredge. The diameter of the rings in the retaining bag was 7.5cm (3 inches). Specimens from two stations with large numbers of pinknecks were examined for this report. These stations, H-15-2 and F-13-2, were at latitudes and longitudes of 57°10' N, 158°51' W, and 56°36' N, 159°56' W respectively. Age was determined for a subsample of clams by counting annuli, a series of closely-spaced concentric growth lines which are the result of slow winter shell growth (see Feder, et al., 1976 and Paul and Feder, 1973 for methods).

RESULTS

A total of 503 *Spisula polynyma* were available for aging from the two stations examined. The annual increase in shell length for pinkneck clams up to ten

years of age is typically 10 to 14 mm. (Tables 1 and 2). In older specimens, the annual increase in shell length decreases to between 4 and 10 mm. per year. The oldest clam examined was 16 years of age and 127 mm. in length. The majority of the catch consisted of clams older than nine years of age. This is due to the size of the retaining rings of the dredge. The age structure tables indicate heavy mortality occurs after age 13. Clams older than 13 years of age accounted for only seven percent of the 503 clams collected.

TABLE 1. Age structure of *Spisula polynyma* from the Bering Sea, near Cape Seniavian, Alaska Peninsula, Station F-13-2, latitude: 56°36' N; longitude: 159°56' W.

Year Class (Age of clams)	Number of Clams	Size Range (mm)
0	0	--
1	0	--
2	4	11 - 14
3	9	16 - 34
4	42	24 - 46
5	39	37 - 59
6	15	49 - 67
7	14	59 - 80
8	14	73 - 94
9	32	70 - 103
10	40	80 - 121
11	48	84 - 118
12	40	98 - 128
13	27	107 - 150
14	14	113 - 135
15	1	119
16	1	127

Total = 340

TABLE 2. Age structure of *Spisula polynyma* from the Bering Sea, North of Port Heiden, Alaska Peninsula, Station H-15-2, latitude: 57°10' N; longitude: 159°56' W.

Year Class (Age of Clams)	Number of Clams	Size Range (mm)
0	0	--
1	0	--
2	0	--
3	0	--
4	0	--
5	0	--
6	2	60 - 66
7	0	--
8	3	65 - 95
9	7	72 - 100
10	18	84 - 118
11	32	89 - 117
12	48	93 - 126
13	34	102 - 120
14	17	110 - 125
15	2	114 - 132

Total = 163

REFERENCES

- Chamberlin, L. J. and F. Stearns. "A geographic study of the clam *Spisula polynyma* (Stimpson)." *Serial Atlas of the Marine Environment, Folio 3*. American Geographic Society, 1963. 12 p.
- Feder, H. M. and A. J. Paul. "Alaska Clams, A Resource of the Future." *Alaska Seas and Coasts*. February 1974. pp. 6-7.
- Feder, H. M., A. J. Paul and J. Paul. "Growth and Size-weight relationships of the pinkneck clam, *Spisula polynuma*, in Hartney Bay, Prince William Sound." *Alaska Procedure of the National Shellfish Association*. 66:21-25.
- Jones, W. G. "Report of the Alaska Clam Fisheries Development Meeting, Juneau, January 14, 1977." National Marine Fisheries Service (Draft Report). 1977
- Paul, A. J. and H. M. Feder. "Growth, recruitment, and distribution of the littleneck clam, *Protothaca staminea*, in Galena Bay, Prince William Sound, Alaska." U. S. Department of Commerce, National Marine Fishery Service, *Fish Bulletin*, 71:665-667. 1973.
- Paul, A. J. and H. M. Feder. "Clam, Mussel, and Oyster Resources of Alaska." IMS Report No. 76-4. Sea Grant Report No. 76-6. 1976. p. 41.
- Yancy, R. M. and W. R. Welch. "The Atlantic coast surf clam - with a partial bibliography." Bureau of Commercial Fisheries Circular 228. 1968. 13 pp.