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A COMPARISON OF THE ICES AND ICNAF MESH MEASURING GAUGES

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INTRODUCTION

At the 1962 Annual Meeting of the International Commission for the Northwest Atlantic Fisheries the proposal to adopt the gauge developed for ICES was accepted by the Commission for research purposes.

Because there had not been enough use of the gauge by other than the scientists who assisted in its development, it was determined that further experiments should be carried out before recommending the gauge for other than a research tool. U.S. Fishery Management Agents of the Branch of Resource Management, Bureau of Commercial Fisheries were requested to assist in making a comparative test of mesh measurements using the new ICES gauge and the ICNAF gauge presently used for enforcement purposes. The objective was to use both gauges in the daily gathering of after-use measurements at four major New England fishing ports. The measurements gathered on several types of net twine and of various mesh sizes were submitted to staff members of the Biological Laboratory Bureau's for statistical analysis.

EXPERIMENTAL DATA

Comparative measurements were obtained from 33 nets by 4 observers. The standard procedure was to measure, in adjacent lines, 40 to 50 meshes with each gauge. The ICNAF gauge was operated in the manner prescribed by the mesh regulation, with an exertion of 12 pounds pressure. The ICES gauge was set at both 6.7 and 10.0 pounds pressure in two different series of measurements. All nets were made of nylon except one of manila twine, as noted. The statistics are presented in Table 1.

At 6.7 pounds the ICES gauge provided estimates which were, on the average, 0.2 inches below those of the ICNAF gauge for the large sized nets. The average size of the one small mesh net was the same for both gauges. When reset at 10 pounds pressure, the ICES gauge still provided measurements for the large-mesh nets which were, on the average, 0.2 inches less than those taken with the ICNAF gauge. Estimated mean size of the small-mesh nets were, on the average, equal for both gauges.

These data indicate that the spring tension adjustment of the ICES gauge is not very critical and does not have a proportional affect on the measurements of large-and small-mesh nets. This may be due to different lays of the twines used in various sizes of mesh. These experiments indicate that a pressure greater than 10 pounds is required to provide equivalent measurement by the two gauges. The estimates of standard deviation do not reveal a wide difference in precision between the two gauges. The ICES gauge, in fact, was slightly more variable than the ICNAF gauge. This result is somewhat contrary to previous experiments. Using the average standard deviation of 0.20, and, n, the number of meshes measured, equal to 45, the 95% confidence interval of the small variability, the estimates of mean size, obtained by the four observers was significantly different, but the absolute magnitude of difference was only 0.1 inch.

COMMENTS ON USAGE OF THE ICES GAUGE

It was the consensus of the four U.S. Fishery Management Agents that the ICES gauge was superior to the ICNAF gauge in several respects:

(a) Ease of use. Measurements of nets were made on board vess which had just completed a trip. The nets were either lashed up for storage under the bulwarks or were hung in the rigging. This is normal practice and, in either case, they were difficult to work with. To use the ICNAF gauge the net has to be in such a position that there is room for the spade to be thrust through the netting; the ICES gauge fingers require no such amount of room. Nets hanging in the rigging are difficult to measure with the ICNAF gauge without help to steady the net and to keep it from swinging away from the operator as the spade is thrust through the netting to the proper pressure.

(b) Ease of reading measurements. At such time as the proper pressure is reach, the ICES gauge locks and no amount of further squeezing of the hand will increase the measurement. The ICNAF gauge has to be checked for pressure and read simultaneously.

SUGGESTED MODIFICATIONS

After having used the ICES gauge for several months the Fishery Management Agents suggested one modification.

In the measurement of large-mesh netting, it was noted that th ICES gauge has one disadvantage due to the fact that the sliding case assembly travels along the entire length of the bar and rack, a distance of approximately 5 inches. The 5 inch reach between the fixed and movable handles caused those operators with small or average sized hands some difficulty.

It was discovered that this disadvantage could be overcome by placing a piece of brass tubing on the bar and rack directly behind the fixed jaw. This piece of tubing may be cut to any desired length from one inch to 2½ inches. This additional part may be called a spacer and when placed in this position, it serves as a stop to prevent the sliding case assembly from returning to its original position against the fixed jaw. This reduces the length of travel of the sliding case assembly. With this slight modification the 5 inch reach between the handles of the gauge is reduced to 4 or less inches.

RECOMMENDATIONS

The new ICES gauges were received in December of 1962 but were not used until a program was initiated in January 1963. Continuous cold weather during the winter interfered with fishing and with opportunities for testing both types of gauges. Because not enough testing has been done to gain the experience and data necessary for proper evaluation we plan to continue the experiment. During the period prior to the 1964 Annual Meeting further data should be collected using higher tensions (12-15 pounds) and extending the measurements to the full range and sizes of twines now in use by the fishing industry. A final report on the usage of the gauge under field conditions will be submitted at the 1964 Annual Meeting.

TABLE 1. STATISTICS OF COMPARATIVE MEASUREMENTS.

OBSERVER	No. meshes Measured	Mean Size (inches)		Standard Deviation	
		ICNAF	ICES	ICNAF	ICES
ICES at 6.7 lbs. press.					
A	42	4.4	4.3	.13	.14
A	42	4.1	3.8	.08	.12
A	42	4.3	4.2	.12	.14
B	50	3.8	3.7	.29	.25
D	44	4.1	3.7	.13	.17
B	45	4.0	3.9	.34	.28
A	41	4.1	4.0	.14	.34
A	42	4.2	3.9	.20	.28
A	41	4.2	3.9	.13	.31
B	43	4.0	3.7	.17	.22
D	40	3.9	3.6	.23	.17
Ave.all obs.	43	4.1	3.9	.19	.22
Ave.obs. A		4.2	4.0	.13	.22
B		3.9	3.8	.27	.32
D		4.0	3.6	.18	.17
E	50	2.3	2.3	.03	.03
ICES at 10 lbs. press.					
B	48	3.9	3.8	.16	.21
D	34	3.9	3.7	.43	.39
B	38	4.6	4.5	.19	.13*
D	48	4.3	4.0	.19	.20
D	49	3.7	3.6	.36	.31
D	34	4.7	4.3	.19	.15
A	42	4.2	3.9	.03	.21
A	42	4.2	4.1	.14	.28
A	42	4.4	4.1	.15	.20
A	42	4.2	4.1	.10	.20
A	42	4.4	4.1	.14	.27
Ave.all obs.	42	4.2	4.0	.19	.23
Ave.obs. A		4.3	4.1	.11	.23
B		4.2	4.1	.18	.17
D		4.2	3.9	.29	.26
E	50	1.7	1.9	.03	.12
E	50	1.8	1.7	.02	.03
E	50	2.0	2.1	.31	.31
E	50	2.0	1.9	.10	.09
E	50	1.8	1.8	.08	.09
E	50	2.2	2.1	.10	.10
E	50	2.5	2.5	.14	.18
E	50	2.4	2.5	.02	.19
E	50	2.3	2.3	.12	.12
E	40	1.9	1.9	.02	.03
Ave.obs. E	49	2.1	2.1	.10	.13

* Manilla net