International Commission for the Northwest Atlantic Fisheries

Serial No. 3938
(D.c.1)

ICNAF Res.Doc. 76/VI/115

ANNUAL MEETING - JUNE 1976

The Polish Plankton Sorting and Identification Center to support fishery assessment investigations.

by

Kenneth Sherman and Leonard Ejysmont
Morski Instytut Rybacki
Zaklad Sortowania i Oznaczania Planktonu
Ul. Kazimierza Krolewicza 3
71-550 Szczecin, Poland

There is a limit to the productive capacity of the marine ecosystem, and from the standpoint of fish catches there is some optimum strategy that will yield a maximal annual catch. Determinations of the optimal catch levels requires knowledge of the basic population processes of recruitment, growth, and natural mortality. For most stocks of fish enormous numbers of eggs and larvae are produced but only a minute fraction survive to become reproducing adults. We do not now know what natural factors cause the large mortality, nor is there presently a satisfactory explanation of the relationship between the size of a spawning stock and the size of the subsequent year-classes. This is an area of fishery science in which better understanding is needed to improve stock abundance forecasts. Obtaining the necessary population information for a particular stock of fish involves a concentrated study of the growth and mortality of the early stages of the year classes, and concurrent observation of related environmental factors. Such a study requires a high frequency of sampling over a considerable area for several months each year of the investigation. A multiship operation of considerable magnitude is necessary to ensure adequate sampling.

On the recommendation of ICNAF, several countries have expanded their fishery assessment survey operations in a joint investigation of the biological and oceanographic factors controlling survival of fish larvae. For the past five years a multi-nation (Canada, France, Poland, Federal Republic of Germany, German Democratic Republic, U.S. and U.S.S.R.) survey of larval herring has been underway in the Georges Bank - Gulf of Maine area. This effort requires considerable laboratory support to ensure that the ichthyoplankton samples are sorted and data made available for analysis in a timely and efficient manner.

A Plankton Sorting and Identification Center was established jointly by Poland and the United States to process ichthyoplankton samples. The Center supports the joint larval herring surveys with systematic sorting and identification of samples from the ICNAF area and adjacent waters in the northwest Atlantic. A building to house the Sorting Center was completed

in August 1974, in Szczecin, Poland, by the Polish Fisheries Central Board at a cost of 3 million zlotys. Key staff appointments were made in April and August 1974. Since that time, U.S. scientists have visited the Center to provide training in sorting and identification methodology; and during the past two years Polish scientists have visited the U.S. to attend ichthyoplankton and zooplankton workshops in taxonomy and laboratory procedures.

The Center presently is staffed with five sorters, thirteen sorter-identifiers and two administrative assistants. The sorting staff has been trained at the Institute of Agriculture and Fisheries in Szczecin. Thirteen of the scientific staff hold M.S. degrees, and five have B.S. degrees in fisheries science and engineering. Present plans call for an increase in staffing so as to provide the capability for sorting up to 4,000 samples annually. This will require an increase of 12 scientific and technical staff by 1977. Dr. Leonard Ejysmont serves as Director of the Center. The U.S. Project Officer is Kenneth Sherman, Northeast Fisheries Center, Narragansett, Rhode Island. Three scientists from each country serve on the Advisory Board for the Center. The Advisory Board meets annually to review progress, establish sorting priorities, and guide Center development.

Following an initial training period, systematic sorting was initiated in April 1975. The Center has processed approximately 1500 ichthyoplankton samples and separated and identified some 200,000 fish larvae and zooplankton constituents. In March 1976 the staff participated in an experiment designed to establish a quantitative basis for aliquoting ichthyoplankton samples. During the experiment, they separated and enumerated 450,000 zooplankters during a three week period. The success of the experiment was largely due to their effort; the results are presented in ICNAF Research Document #76/84. Principal sorting effort in 1976 will be directed to the ICNAF larval herring samples. A summary of the samples to be sorted is given in Table 1; sorting protocols that will be followed are described in an accompanying ICNAF Research Document.

A system has been developed by MARMAP for the rapid archiving and retrieval of larval and zooplankton data. The Sorting Center is provided computer generated print-outs of station information (time, location, tow-type, depth), net tow data, and cruise track and station position plots for each of the survey cruises (Table 2, Fig.1). Processed data is forwarded by the Sorting Center to the Northeast Fisheries Center Laboratory at Narragansett, Rhode Island for entry into a computer system. Special data forms have been developed which allow for optical scanning of all data entry including log-sheets for zooplankton biomass, volume, species identification, and length frequencies. Processed data summaries will be made available to scientists of countries participating in the cooperative ICNAF larval herring surveys. Within the next few months, the data system will have the capability for producing automated plots of oceanographic features including salinity, temperature, oxygen, chlorophyll, and nutrient profiles.

Table 1. List of samples to be sorted in 1976 collected during the cooperative ICNAF Larval Herring Surveys, 1971-1975

Priority for Sorting of ICNAF .333 Samples

1) 1975 - BELOGORSK - 2 Cruises 75-02 and 75-03
- ANTON DOHRN - 75-187
- ALBATROSS - 75-02
- ALBATROSS - 75-14
- WALTHER HERWIG - 75-1

2) 1974 - WIECZNO - 73-10
- ALBATROSS - 75-2
- USSR - PROGNOZ 74-1
- ANTON DOHRN 74-1
- ALBATROSS 74-13
- FRA CRYOS 74-4
- WALTHER HERWIG - 74-1

3) 1973 - FRA CRYOS 73-1
- POL WIECZNO 73-10
- USSR BELOGORSK 73-1
- FRG WALTHER HERWIG 73-1
- USA ALBATROSS 73-9
- USA ALBATROSS 74-2

4) 1972 - USSR ARGOS 72-1
- POL WIECZNO 72-10
- USSR ARGOS 72-2
- FRG WALTHER HERWIG 71-1
- USA ALBATROSS 71-1

5) 1971 - FRA CRYOS 71-1 missing - awaiting reply from St. Pierre
- USA DELAWARE 71-4
- USSR VIANDRA 71-1
- FRG WALTHER HERWIG 71-1
- USA ALBATROSS 71-7

MARMAP INFORMATION SYSTEM - STATION ACTIVITIES SUMMARY

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE

Time is expressed in GMT and depth in meters. S means surface and C means continuous. Zooplankton net sizes are expressed as mouth dimensions in CM (Bongo diameter) or meters (Neuston height x width)/mesh in microns. Bongo depths from top (A indicates depth calculated from wire angles). Asterisks indicate data not available.
E indicates an estimate.

ALBATROSS: CRUISE 75-14
5 DECEMBER - 17 DECEMBER 1975

STATION	DATE	POSITION LAT.	POSITION LONG.	OBSERVATIONS TYPE		BT	HAUL	START TIME	DURATION (MIN:SEC)	FREQUENCY MAX. DEPTH
1	17 12 75	41 11 N	071 00 W	BONGO	61/505		1	1835	4:19	1/19
				BONGO	61/333		1	1835	4:19	1/19
				BONGO	20/253		1	1835	4:19	1/19
				BONGO	20/165		1	1835	4:19	1/19
				NEUSTON	0.5X1.0/505		1	1835	10:03	1/S
4	17 12 75	41 00 N	071 00 W	BONGO	61/505		1	1724	9:06	1/39
				BONGO	61/333		1	1724	9:06	1/39
				BONGO	20/253		1	1724	9:06	1/39
				BONGO	20/165		1	1724	9:06	1/39
				NEUSTON	0.5X1.0/505		1	1725	10:00	1/S
5	17 12 75	41 00 N	071 25 W	BONGO	61/505		1	1541	10:00	1/40
				BONGO	61/333		1	1541	10:00	1/40
				BONGO	20/253		1	1541	10:00	1/40
				BONGO	20/165		1	1541	10:00	1/40
				NEUSTON	0.5X1.0/505		1	1542	10:08	1/S
6	17 12 75	40 44 N	071 00 W	BONGO	61/505		1	1132	10:02	1/35
				BONGO	61/333		1	1132	10:02	1/35
				BONGO	20/253		1	1132	10:02	1/35
				BONGO	20/165		1	1132	10:02	1/35
				NEUSTON	0.5X1.0/505		1	1133	10:05	1/S
7	17 12 75	40 30 N	071 00 W	BONGO	61/505		1	0943	15:02	1/65
				BONGO	61/333		1	0943	15:02	1/65
				BONGO	20/253		1	0943	15:02	1/65
				BONGO	20/165		1	0943	15:02	1/65
				NEUSTON	0.5X1.0/505		1	0943	10:12	1/S
9	17 12 75	40 16 N	071 30 W	BONGO	61/505		1	0431	19:00	1/83
				BONGO	61/333		1	0431	19:00	1/83
				BONGO	20/253		1	0431	19:00	1/83
				BONGO	20/165		1	0431	19:00	1/83
				NEUSTON	0.5X1.0/505		1	0432	10:02	1/S

MARMAP INFORMATION SYSTEM - DETECTION DATA

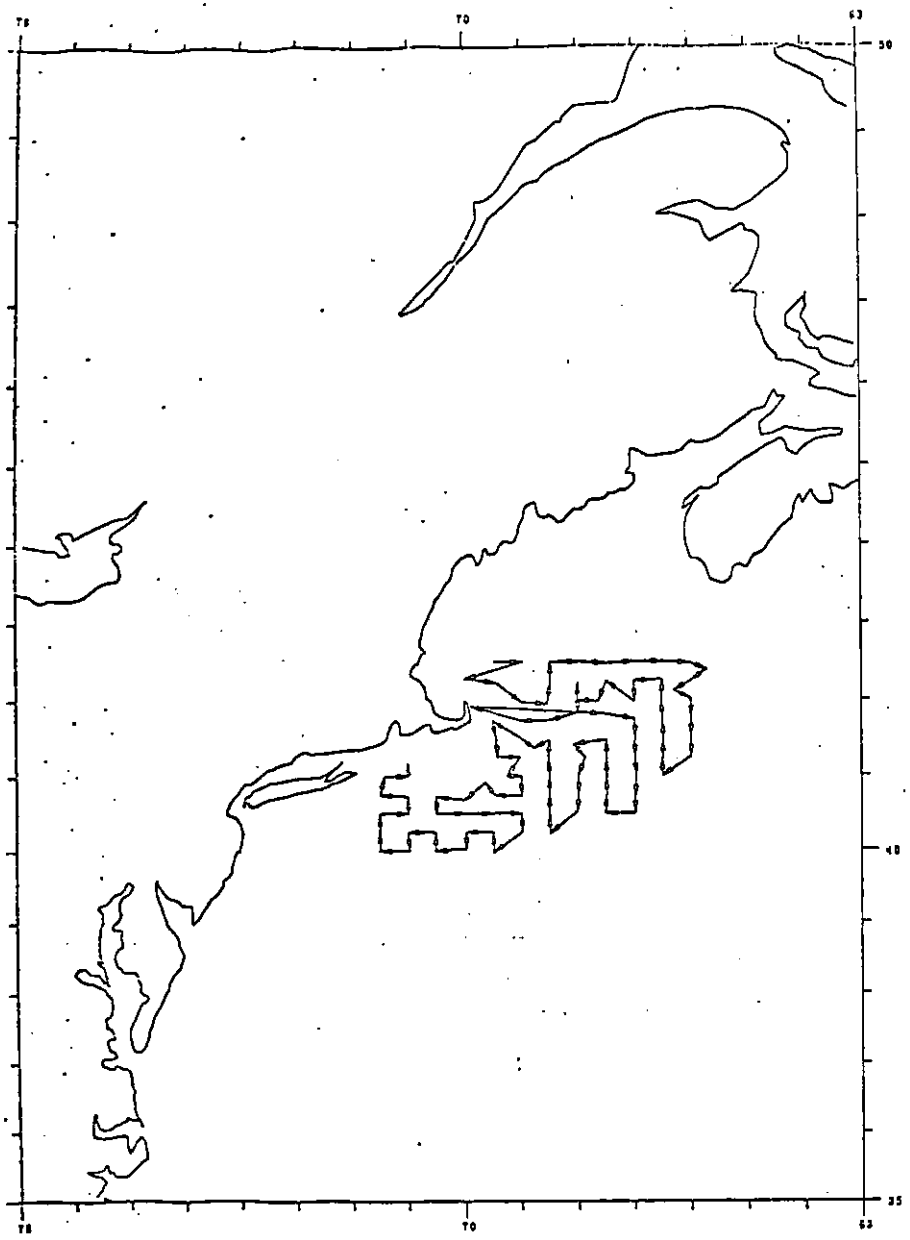
U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE

REFER TO LAST PAGE FOR DEFINITIONS OF SYMBOLS, COLUMN HEADINGS, AND COLUMN CONTENTS

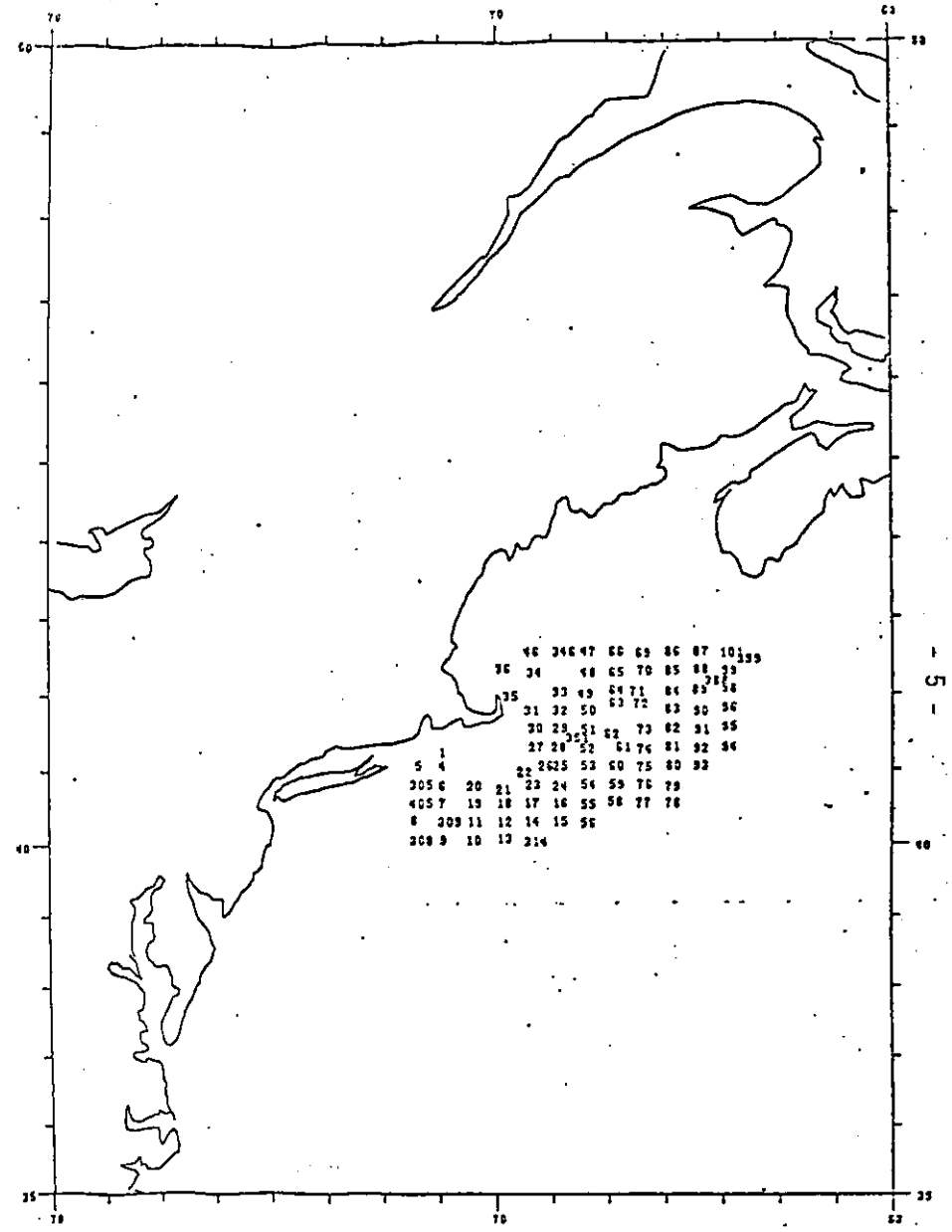
ALBATROSS: CRUISE 75-14
5 DECEMBER - 17 DECEMBER 1975

STATION	MAIN	NET TYPE	NET SPEED FROM FLOWMETER M/SEC	VOLUME FILTERED (M3)	DEPTH (M)	WATER COLUMN STANDARD HAUL FACTORS #/10 M2	WATER COLUMN STANDARD HAUL FACTORS #/1000 FT3	SURFACE STANDARD HAUL FACTOR #/1000 M2
1	1	BONGO 61/505	1.84	139.44	19	1.36	7.17	
		BONGO 61/333	1.79	135.74		1.39	7.36	
		BONGO 20/253	1.80	14.67		12.95	68.17	
		BONGO 20/165	1.50	12.17		15.61	82.16	
	1	NEUSTON 0.5X1.0/505	1.80 E	271.41 E	S			0.92 E
4	1	BONGO 61/505	1.59	254.28	39	1.53	3.93	
		BONGO 61/333	1.56	248.41		1.56	4.02	
		BONGO 20/253	1.61	27.63		14.11	36.18	
		BONGO 20/165	1.33	22.77		17.12	43.91	
	1	NEUSTON 0.5X1.0/505	1.80 E	270.96 E	S			0.92 E
5	1	BONGO 61/505	1.81	316.56	40	1.26	3.15	
		BONGO 61/333	1.76	308.12		1.29	3.24	
		BONGO 20/253	0.73	14.73		27.16	67.90	
		BONGO 20/165	0.63	11.96		33.43	83.58	
	1	NEUSTON 0.5X1.0/505	1.80 E	273.66 E	S			0.91 E
6	1	BONGO 61/505	2.22	391.22	35	0.89	2.55	
		BONGO 61/333	2.11	370.81		0.94	2.69	
		BONGO 20/253	1.17	22.71		15.76	45.02	
		BONGO 20/165	1.09	20.49		17.08	48.80	
	1	NEUSTON 0.5X1.0/505	1.80 E	272.31 E	S			0.91 E
7	1	BONGO 61/505	1.77	467.81	65	1.38	2.13	
		BONGO 61/333	1.73	456.08		1.42	2.19	
		BONGO 20/253	1.81	51.28		12.67	19.49	
		BONGO 20/165	1.50	42.53		15.28	23.51	
	1	NEUSTON 0.5X1.0/505	1.80 E	275.46 E	S			0.90 E
8	1	BONGO 61/505	1.73	576.63	83	1.43	1.73	
		BONGO 61/333	1.68	550.46		1.48	1.79	
		BONGO 20/253	1.77	63.25		13.12	15.80	
		BONGO 20/165	1.53	53.09		15.45	18.62	
	1	NEUSTON 0.5X1.0/505	1.80 E	270.96 E	S			0.92 E
9	1	BONGO 61/505	1.35	553.16	100	1.80	1.80	
		BONGO 61/333	1.31	537.09		1.85	1.85	
		BONGO 20/253	1.29	66.57		17.55	17.55	
		BONGO 20/165	1.14	50.21		19.91	19.91	
	1	NEUSTON 0.5X1.0/505	1.80 E	272.31 E	S			0.91 E

Table 2. Station activity summary for one of the cooperative ICNAF Larval Herring Surveys. The data was produced by the Marine Monitoring Assessment and Prediction (MARMAP) program of the National Marine Fisheries Service.



ALBATROSS IV CRUISE 75-14
5 DEC. 1975 - 17 DEC. 1975
CRUISE TRACK



ALBATROSS IV CRUISE 75-14
5 DEC. 1975 - 17 DEC. 1975
STATION POSITIONS

Figure 1. Computer generated cruise track and station location plots for one of the Cooperative ICNAF Larval Herring Surveys.