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INFORMAL REPORT

WORLD ATLAS OF COASTAL BIOLOGICAL FOULING PART I NORTH AMERICA, SOUTH AMERICA, ICELAND AND GREENLAND

SEPTEMBER 1970

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NAVAL OCEANOGRAPHIC OFFICE
WASHINGTON, D.C. 20390

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13. ABSTRACT

This atlas is the first of a three part series, and is a comparison of available biofouling data covering the coastal areas of North and South America, Iceland and southern Greenland. The report contains 17 regional charts and a world reference chart. Specific biofouling locations, general areas, and severity are indicated on the regional charts, and the chart entries are cross-referenced in an index section according to chart/country, country/area, numerical and alphabetical notations.

A fouling severity key correlates word designations of severity with wet weight (kg./m^2) in air values, and chart symbolization. Ten major groups of organisms are represented on a series of data sheets corresponding to regional charts and the index section. The organisms are algae, amphipods, anemones, barnacles, bryozoans, hybroids, molluscs, sponges, tubeworms and tunicates. Information concerning these organisms are month(s) of maximum attachment, relative abundance, and other pertinent data including generic names. Predictions of fouling severity are made where sufficient data warrants such forecasting. An extensive references section concludes the report.

Eventual computerization of biofouling information into a "live" atlas is intended through the basic design of the atlas format and data presentation.

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14 KEY WORDS	LINK A ROLE	LINK A WT	LINK B ROLE	LINK B WT	LINK C ROLE	LINK C WT
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FOULING						
NORTH AMERICA						
SOUTH AMERICA						
ICELAND						
GREENLAND						
FOULING INTENSITY						
FOULING ORGANISMS						
ATLAS						

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Acting Director
Exploratory Oceanography Division

DATE: 1 September 1970

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PREFACE

Part I of the World Atlas of Coastal Biological Fouling is presented with the user in mind. The atlas format is intended to be open ended so that information can be added, or deleted, by the user without upsetting the system of presentation. As a result, this publication can be construed as a "live" atlas, and consequently a source document which hopefully will be updated on a continuous basis to provide the most reliable information available. Eventual computerization of biofouling information into a "live" atlas is intended through the basic design of the atlas format and data presentation.

As a prototype, the atlas has inherent shortcomings, many of which can be rectified through constructive suggestions, and updating of information. Persons or groups interested in the increasingly important field of biological fouling are requested to contribute usable atlas information to this Office.

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ACKNOWLEDGEMENTS

Defining the scope of this source document, and the fusing of diverse data into a comprehensive format has been a difficult, but rewarding task. Numerous problems arose during development of the atlas, and at times, these problems seemed insurmountable. In due course these problems were overcome, but only with the help of the following people.

Recognition is accorded to M. Burkhardt, H. Weston, and F. M. Daugherty, Jr. for their initial work towards the atlas concept. Acknowledgements are extended to J. Lackie, R. Tittle, M. Beeston, S. Arny, and J. Jesswein for their specialized contributions.

Special acknowledgement is extended to W. Glidden and L. Fisher for their constructive criticisms, and developmental suggestions on all facets of the atlas.

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ATLAS ABBREVIATIONS

Ab., Abundant
Ala., Alabama
Alas., Alaska
Alg., Algae
Apr., April
Arg., Argentina
Att., Attachment
Aug., August

Bah., Bahama(s)
Barns., Barnacles
Berm., Bermuda
Braz., Brazil
Brys., Bryozoans

Calc., Calcareous
Calif., California
Can., Canada
Col., Colonial
Conn., Connecticut

Dec., December
Del., Delaware
Dom., Dominated, Dominant

E, Encrusting
E., East(ern)
Echins., Echinoderms
Ecua., Ecuador

F., Filamentous
Feb., February
Fla., Florida
Ft., Fort, Feet

G., Gulf
Ga., Georgia
Gasts., Gastropods
Grl., Greenland

Hbr., Harbor
Hyds., Hydroides

Ice., Iceland
Incl., Include(s)
Is., Island(s)

Jan., January
Jam., Jamaica

L, Light
La., Louisiana
Lat., Latitude
LM, Light to Moderate
Loc., Location
Long., Longitude

M., Meter(s)
M, Moderate
M.A., Maximum Attachment
Mass., Massachusetts
Mar., March
Md., Maryland
Me., Maine
Mi., Mile(s)
Miss., Mississippi
Mols., Molluscs
MS, Moderate to Severe
Mt., Mountain(s)
Muss., Mussels

N., North(ern)
N.C., North Carolina
N.E., Northeast
Newf., Newfoundland
N.H., New Hampshire
N.J., New Jersey
Nov., November
Nudis., Nudibranchs
N.W., Northwest
N.Y., New York

Oct., October
Op., Operating
Ore., Oregon

P., Presence
Pa., Pennsylvania
Pan., Panama
Pels., Pelecypods
Pen., Peninsula
P.R., Puerto Rico
Pred., Predicted

Rel., Relative
R.I., Rhode Island

S, Severe
S., South
S.C., South Carolina
S.E., Southeast
Sep., September
So., South
Sol., Solitary
Sp., Species
St., Saint(e)
Str., Strait
S.W., Southwest

T, Trace
Terr., Territory
Tex., Texas
TL, Trace to Light
Tubes., Tubeworms
Tuns., Tunicates

U.K., United Kingdom
Uru., Uruguay
U.S., United States
U.S.N., United States Navy
U.S.S.R., Union of Soviet Socialists Republics

Va., Virginia
VS, Very Severe

W., West(ern)
Wash., Washington

Yr., Year

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INTRODUCTION

Purpose

The purpose of this atlas is to present a consolidated, readily available, easy to use source of world wide coastal biological fouling conditions to users and researchers alike. In addition, an attempt is made to define those organisms which significantly contribute to biological fouling, their substrate attachment time periods, and their abundance relative to the total fouling community within a given geographical area. The atlas is also intended to serve as a continuous biofouling prediction mechanism for those coastal areas where fouling data are either sparse or absent.

Geographic Areas

When completed, the atlas will be comprised of three major parts, each of which will constitute a separate, but interrelated volume. Each part depicts continuous coastal areas of the globe, and each part is subdivided into smaller geographical sections defined as regional charts.

Part I of the atlas contains 17 regional charts (1-17) as illustrated in the World Reference Chart (Chart 18). The regional charts cover the coastal areas of North and South America, Iceland and southern Greenland.

Part II will tentatively contain coastal areas of Africa, the Indian Ocean and Mediterranean Sea, Europe, the northern reaches of Asia, and associated islands of the Atlantic Ocean.

Part III will provisionally contain the following coastal areas: East and Southeast Asia, Australia, New Zealand, and source data islands of the Pacific Ocean.

Previous Studies

Numerous examples of group and individual research reports have dealt with a wide range of biological foulers; their ofttimes polluted locales;

their interrelationships within and outside the marine fouling community; their problematic effects on man made and natural underwater structures, and so on. Historical and present studies, as well as those to follow, will continue to be of increasing importance as long as man continues to explore and utilize the marine environment.

The list of diversified fouling studies is seemingly endless, and the data presented is voluminous, as well as varied, both in reporting techniques and methodology. For these reasons, a historical treatise on the subject will not be attempted.

The Selected References section located at the end of this atlas is but a small cross-section of available reports and papers. Consequently, the references should not be construed as all encompassing.

DATA PRESENTATION

Sources, Analysis, Severity

Data presented for specific locations are extrapolations from original sources. In all cases where two or more data sources were obtained for a particular location, the information was analyzed collectively and correlated to produce a singular trend.

Past presentations of original data have taken various forms of expression. A popular form of indicating fouling severity makes use of word designations. Some notations of this type are light, heavy, medium, severe, and so forth. Another popular method of data expression is in terms of the wet and/or dry weight of the fouling organisms per unit area. This method of data presentation is numerical and the unit of measurement is either english, metric, or a combination of both. The Fouling Severity Key (Table I), presented for the first time, combines aspects of the two popular methods, and has been used for extrapolation of source data used in this atlas. Although arbitrary, the key will hopefully provide a meaningful and useful standard for reporting biological fouling information.

FOULING SEVERITY KEY

DESIGNATION	LETTER SYMBOL	MAP SYMBOL	WET WT. IN AIR kg./m^2
PRESENCE	P	NONE	NONE
TRACE	T	●●●●●●●	<5.00
TRACE TO LIGHT	TL	o·o·o·o·o	5.01–10.00
LIGHT	L	.....	10.01–15.00
LIGHT TO MODERATE	LM	—·—·—·—	15.01–25.00
MODERATE	M	— — — — —	25.01–35.00
MODERATE TO SEVERE	MS	XXXXXXX	35.01–45.00
SEVERE	S	————	45.01–55.00
VERY SEVERE	VS	ΔΔΔΔΔΔ	>55.01

Table I: FOULING SEVERITY KEY

Two basic types of data error may be included in the atlas. Some errors are inherent in the original study, whereas others may originate through extrapolation and transfer of source data for atlas presentation.

Prediction

Predictions of fouling severity and larval attachment periods are based on analog methods of forecasting. Predictions have been made from examination and correlation of physical environmental data, and bio-fouling trends adjacent to, and including, the specific area of interest.

Abbreviations

Abbreviations are extensively used to provide a more compact source of available information. A majority of the abbreviations utilized follow accepted usage, whereas others have been innovated for ease and convenience.

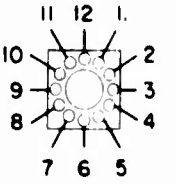
Data Sheets

The columnar format of the data sheet is designed to offer the user fouling information at a glance. Key numbers and abbreviations are exployed as mechanisms for presentation of consolidated information, cross-referencing purposes, and possible analog studies.

A representative data sheet (Table II) is illustrated below, and explanation of headings and associated information entries follows.

CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS – MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES	
5	10	4			3	2	1					M

ADDITIONAL INFORMATION	
1 - JAN	7 - JUL
2 - FEB	8 - AUG
3 - MAR	9 - SEP
4 - APR	10 - OCT
5 - MAY	11 - NOV
6 - JUN	12 - DEC



E & F BRYS., RED (M.A. 6-8) & GREEN (M.A. 3-5) ALG., ACORN BARNS

Table II: DATA SHEET EXAMPLE

1. Proceeding from left to right, the number 5 in the CHART NUMBER column refers to regional chart number 5, which depicts a section of the eastern coast of the United States.

2. The number 10, under the column labled LOCATION NUMBER, refers to a specific location on chart number 5. In this case, 5-10 is the number designation for the Block Island area of the state of Rhode Island. A letter notation (A, B, C, etc.) under this column heading denotes a general, rather than specific area. Specific location numbers and letters also appear on the regional charts for correlation with data sheet entries.

3. The FOULING ORGANISMS column contains a list of those organisms which are considered to be somewhat cosmopolitan in their distribution. The scope of this atlas necessitates exclusion of other fouling organisms, such as bacteria, for lack of available information relating to a given fouling community.

Under each group of fouling organisms are "daisy" configurations which constitute the format for presentation of months of maximum attachment (M. A.), relative abundance, and presence (P) data. The small circles within the daisy represent, in clock fashion, months of the year. A key to the daisy is located under the ADDITIONAL INFORMATION column. If blackened, these circles denote months of maximum attachment for the particular fouling organism. For example, location 5-10 under the heading of barnacles reads maximum attachment during the months of March, April, and May. Designations of months of M. A. are either predicted or directly taken from the literature. Predictions are so noted in the ADDITIONAL INFORMATION column. In essence, all M. A. notations are subject to change with possible changes in the organism's environment, and updated information.

Information within the large circle of the daisy is as follows: a number designation indicates relative abundance of that particular organism to other fouling organisms occupying the same location. The number 1 indicates most abundant, whereas the number 2 refers to the second most abundant, and so on. Entry of the letter P denotes only presence of the organism, and does not carry relative abundance significance.

4. Notations in the SILT COVER column pertain to relative deposition of silt upon the fouling community. Silting data is reported directly as taken from the literature.

5. The ADDITIONAL INFORMATION column contains supplementary data regarding the fouling organisms and their location. Translation of the exampled information is as follows: both encrusting and filamentous

bryozoans are present; algae is represented by the reds, which have a maximum attachment from March to May; the barnacles are "acorn" in type. Dates contained in the data sheets are expressed numerically. For example, 6 December 1944 is expressed as 6.12.44.

Charts

The atlas contains 17 sequentially numbered regional charts and one world chart. The latter defines boundaries of the regional charts, and is therefore an overall reference to the regional areas. Boundary overlap occurs only between charts 3 and 4, and between 7 and 8. All other chart boundaries adjoin one another.

Significant chart data includes country names, regional and specific location numbers, as well as continuous symbolization depicting fouling severity. Positions of severity symbols on the charts bear no relationship to seaward extent of biofouling.

Chart/Country Index (II)

Countries appearing on each chart are listed according to sequential chart numbers, 1 through 17, followed by their respective names in alphabetical order.

Country/Area Index (III)

This index alphabetically identifies specific areas within each country listed. These locations are further identified according to a number sequence as illustrated by the following example.

CANADA, Charts 3, 4, 15
Argentia, Newf., 4-12

The above designation means that Canadian coastlines appear on regional charts 3, 4, and 15. The 4-12 sequence specifies that Argentia, Newfoundland appears on regional chart 4, location number 12 on that particular chart.

Numerical Index (IV)

Specific fouling locations are listed according to a numerical sequence in association with regional chart numbers. The location number is followed by the name of the location or area, then state and country as in the following example.

CHART 6
1. Tampa, Fla., U. S.

Alphabetical Index (V)

Names of specific locations and areas are indexed alphabetically. The names are followed by the state, if any, and country of origin; then by a cross-referencing number sequence in accordance with all other indices. In the following example, the sequence 16-4 indicates that Adak Island has location number 4 on Chart 16.

Adak Is., Alas., U. S., 16-4

REGIONAL CHARTS

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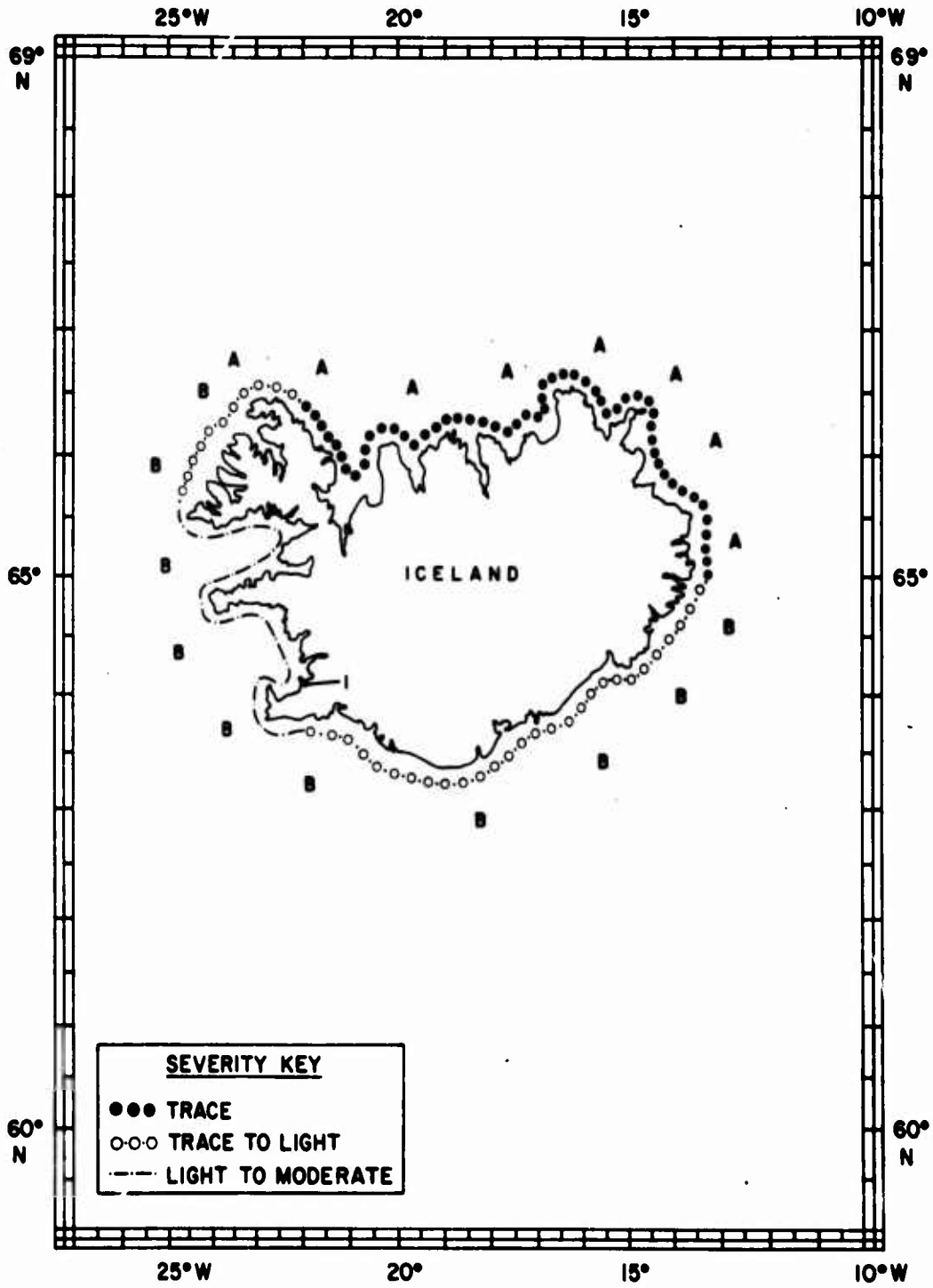

CHART 1 - ICELAND

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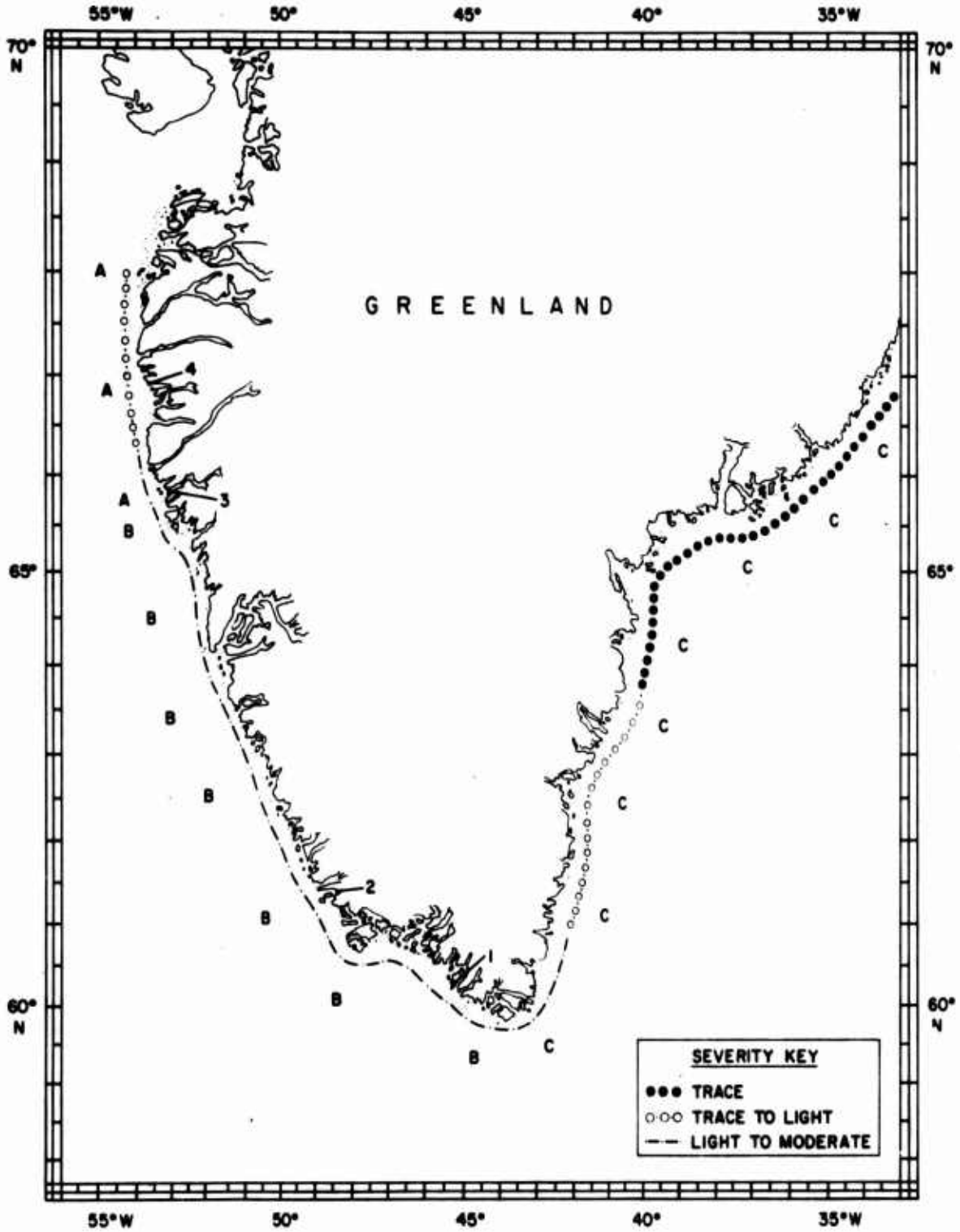

CHART 2 - S. GREENLAND

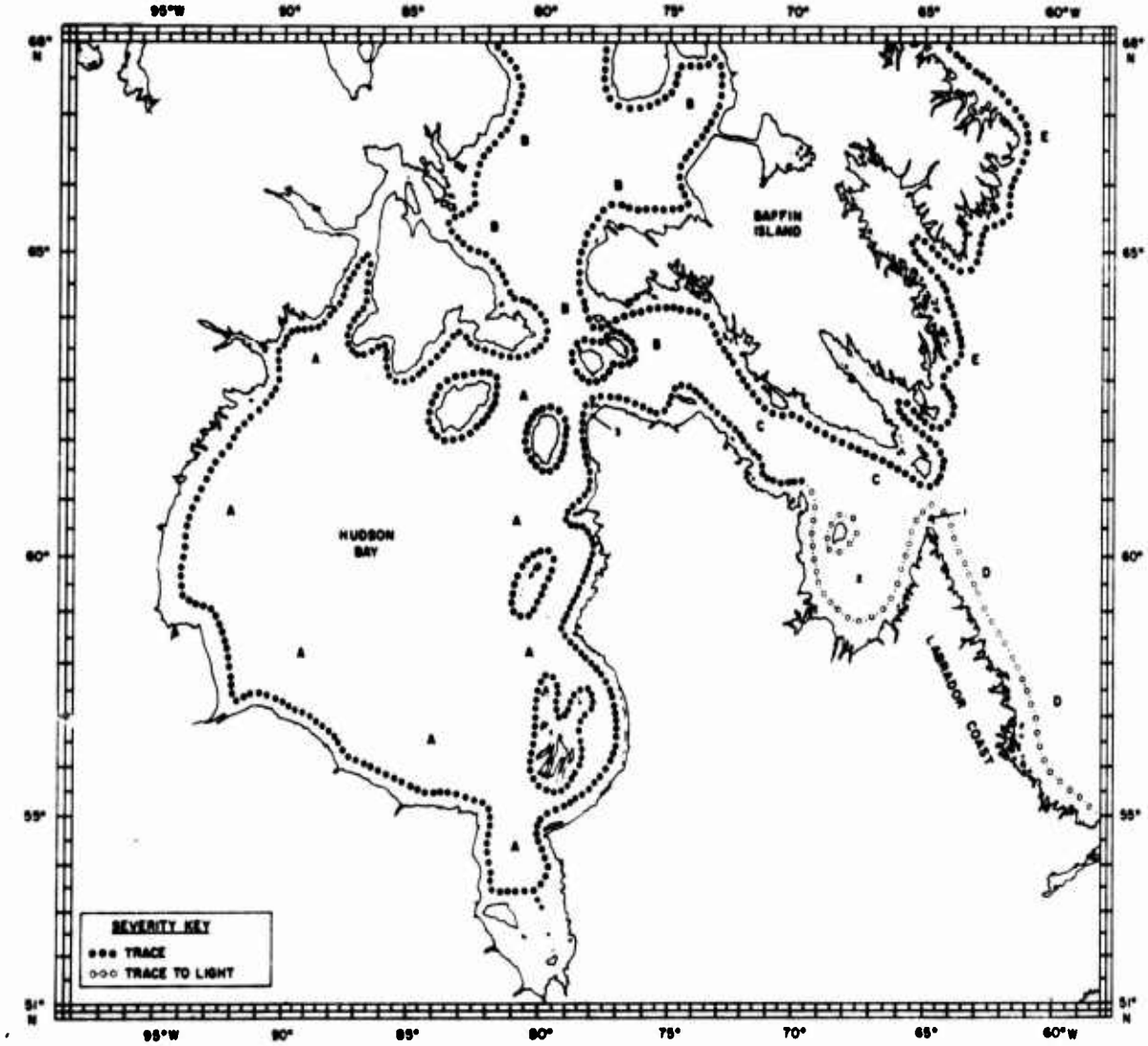

CHART 3 - HUDSON BAY

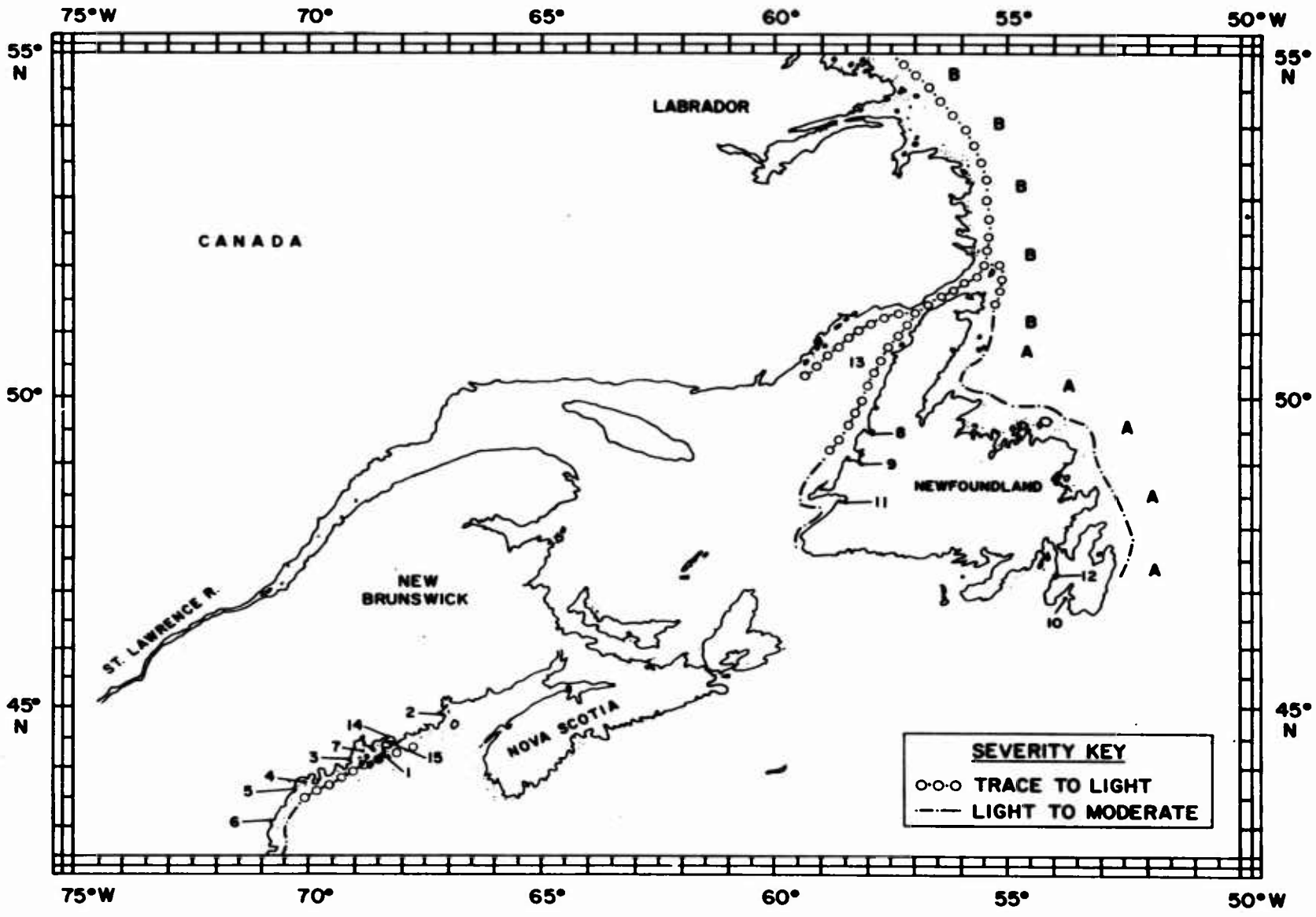

CHART 4 - ATLANTIC CANADA

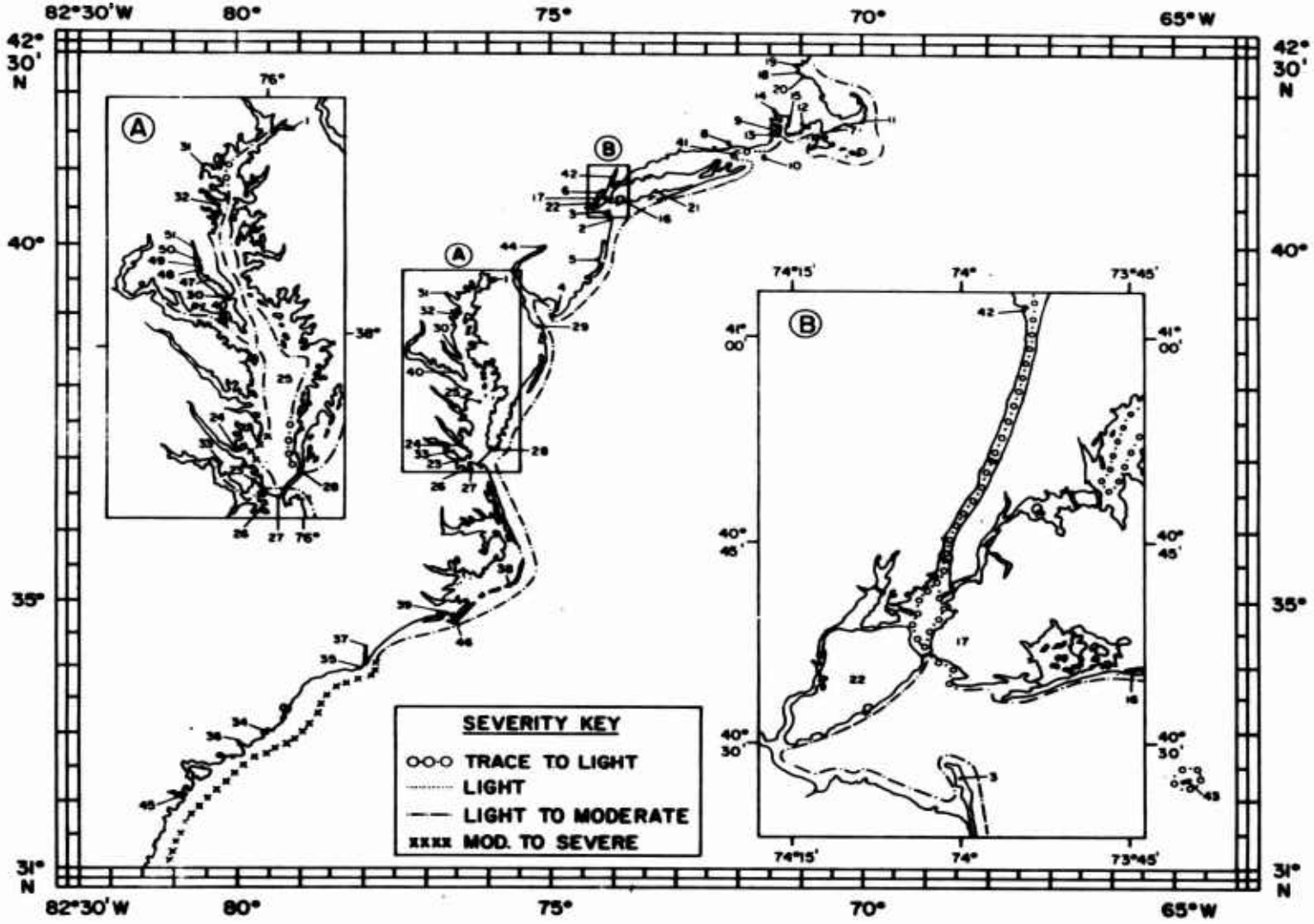

CHART 5 - ATLANTIC UNITED STATES

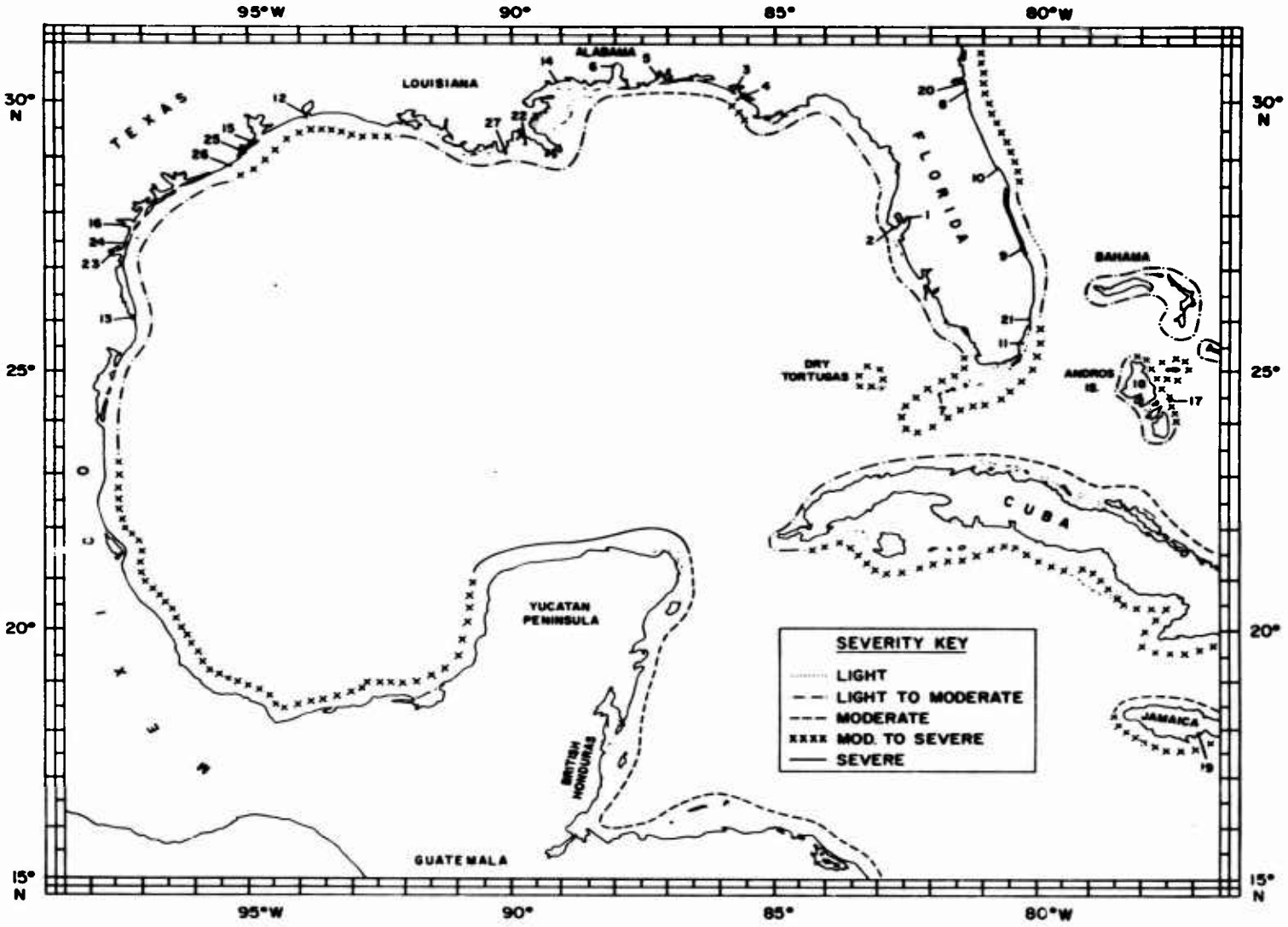

CHART 6 - GULF OF MEXICO, W. CARIBBEAN SEA

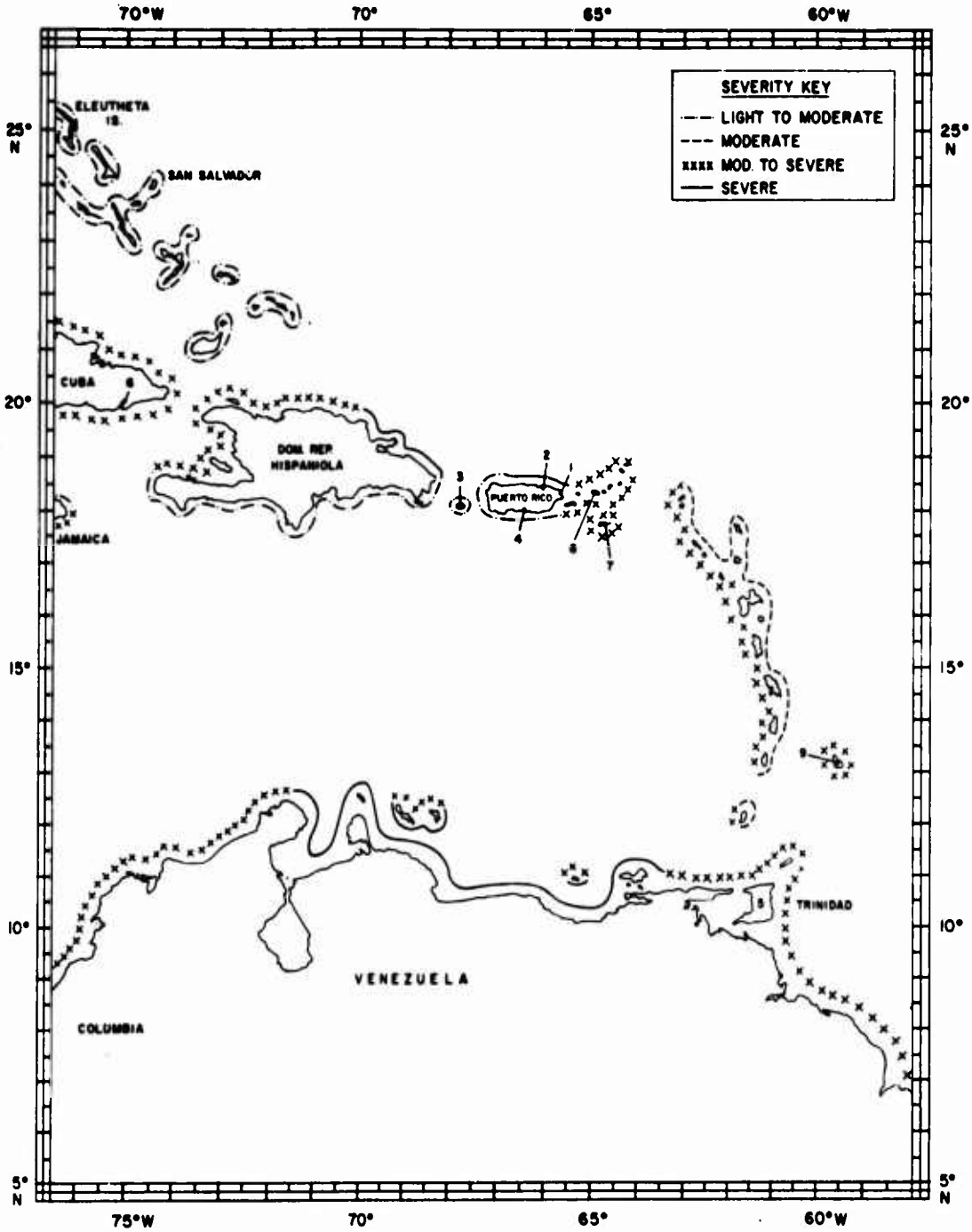

CHART 7 - E. CARIBBEAN SEA, W. INDIES

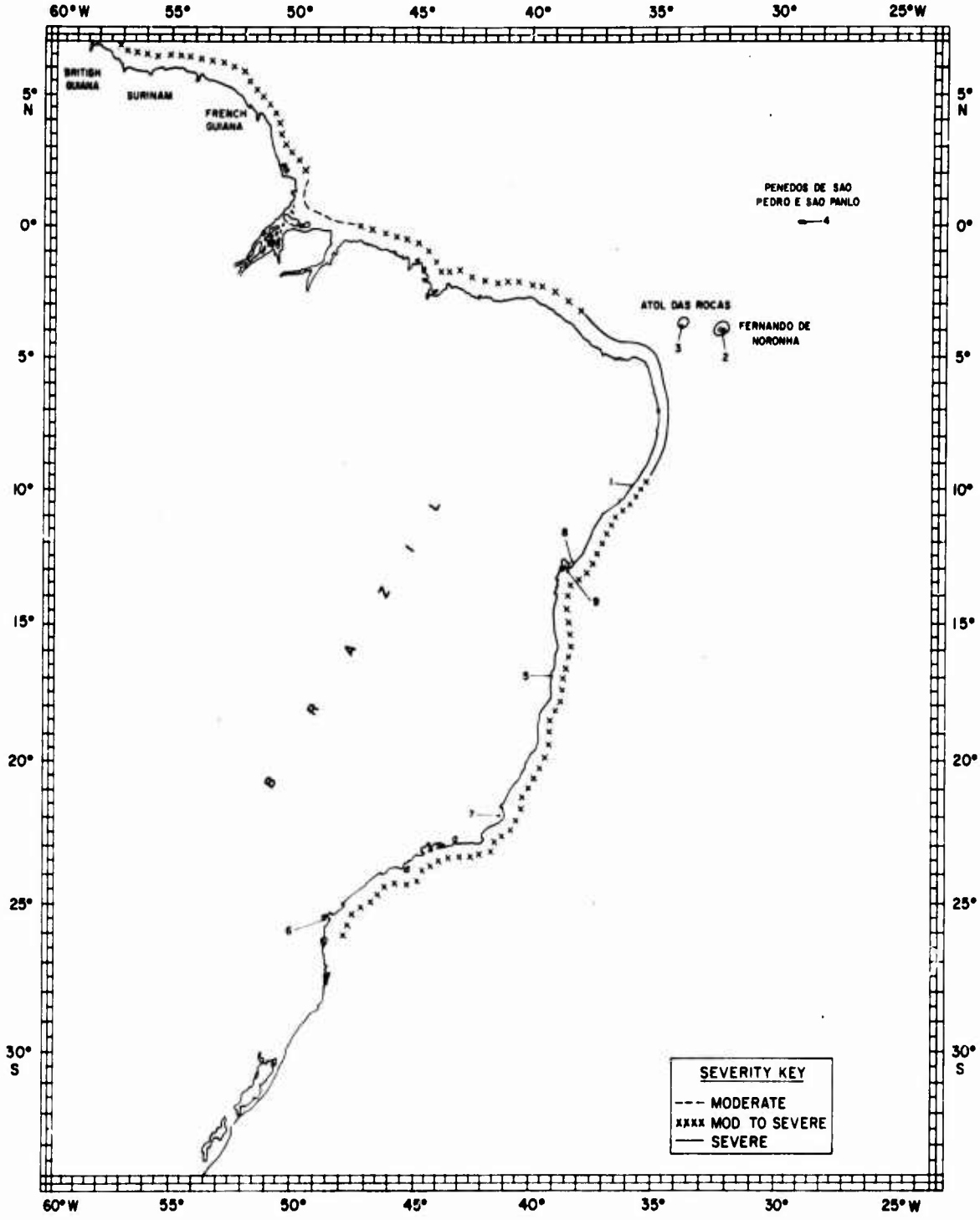

CHART 8 - BRAZILIAN COAST

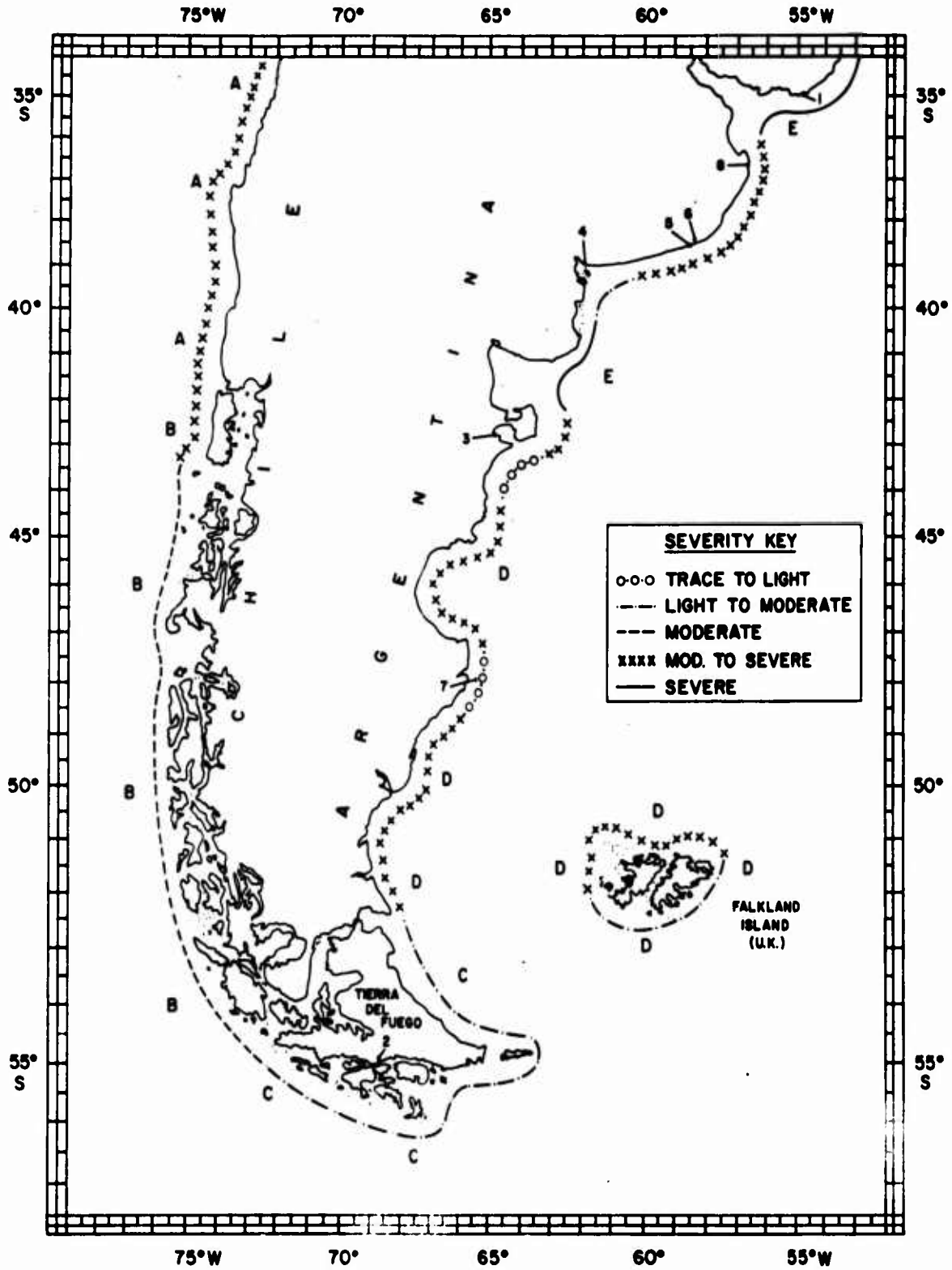

CHART 9 - CHILE, ARGENTINA

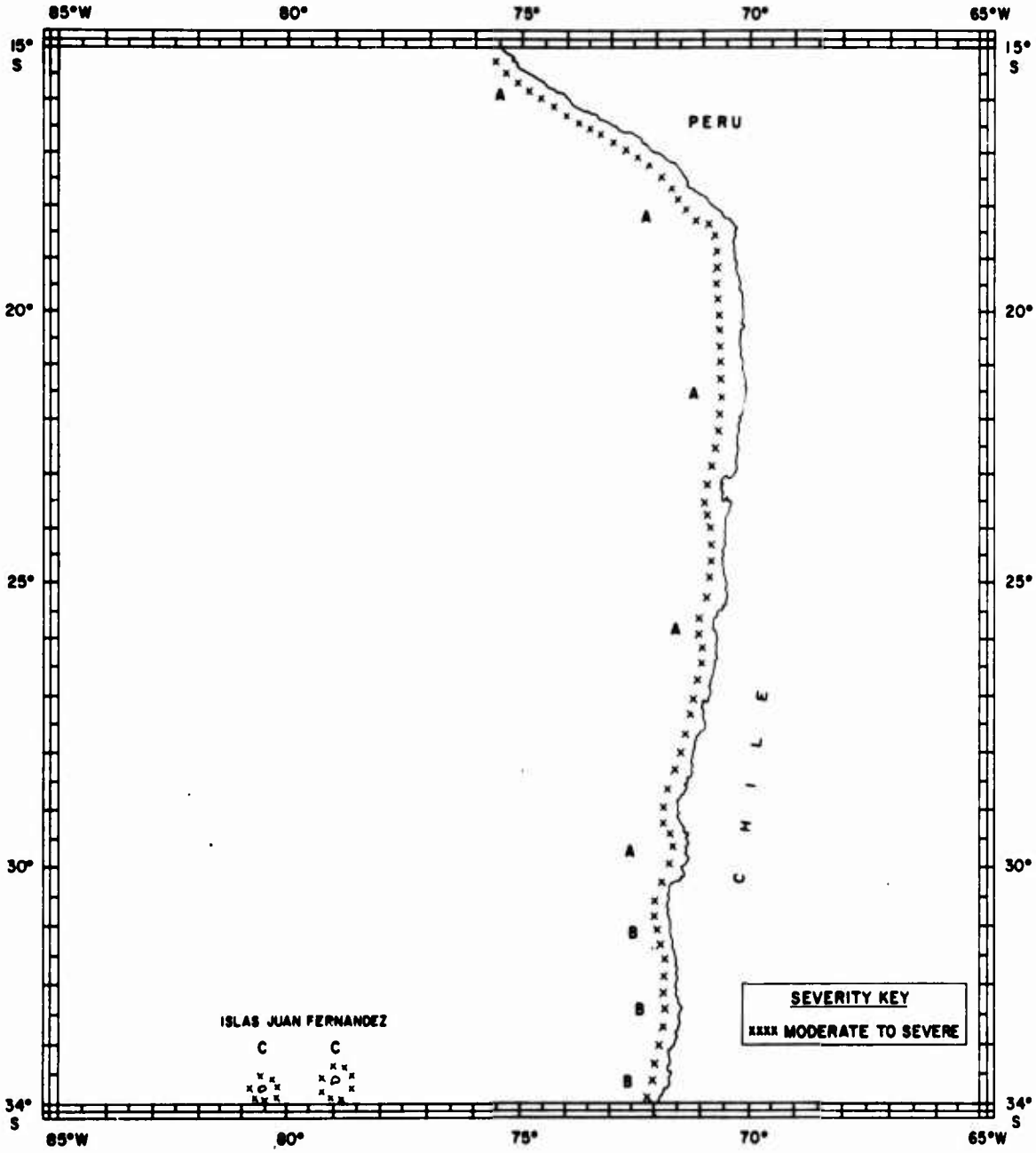

CHART 10 - CHILE, PERU

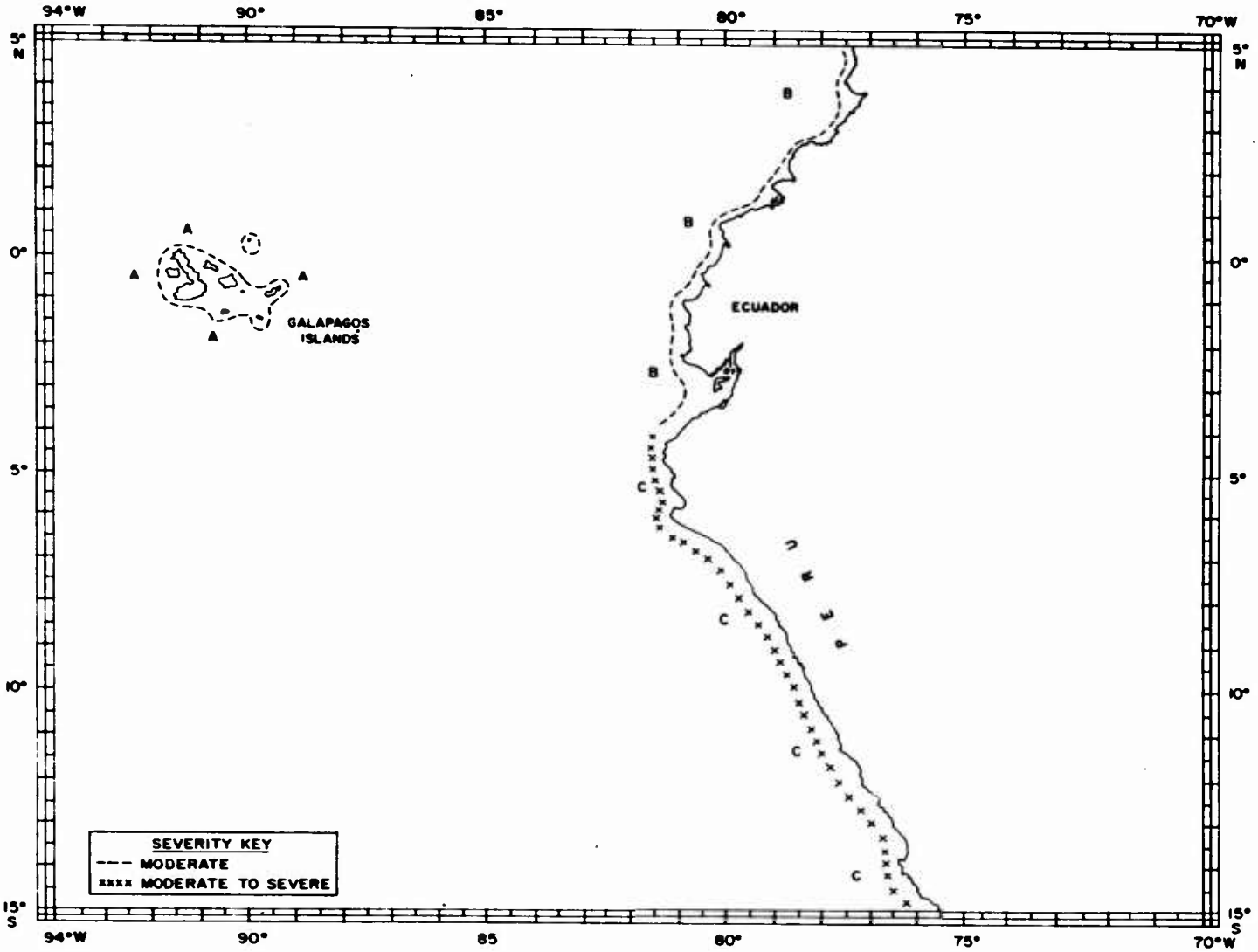

CHART 11 - COLUMBIA, EDUADOR, PERU

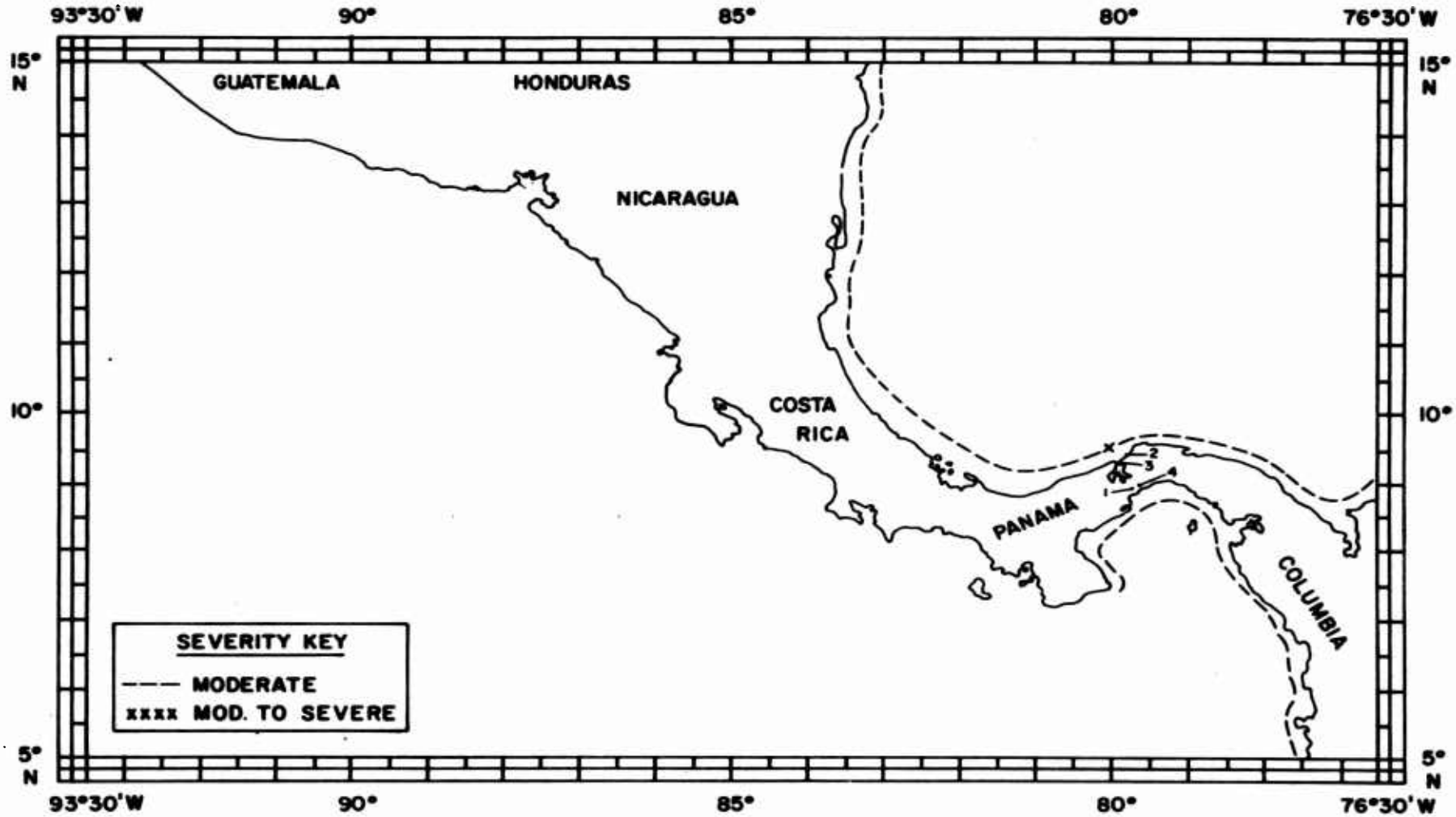

CHART 12 - CENTRAL AMERICA

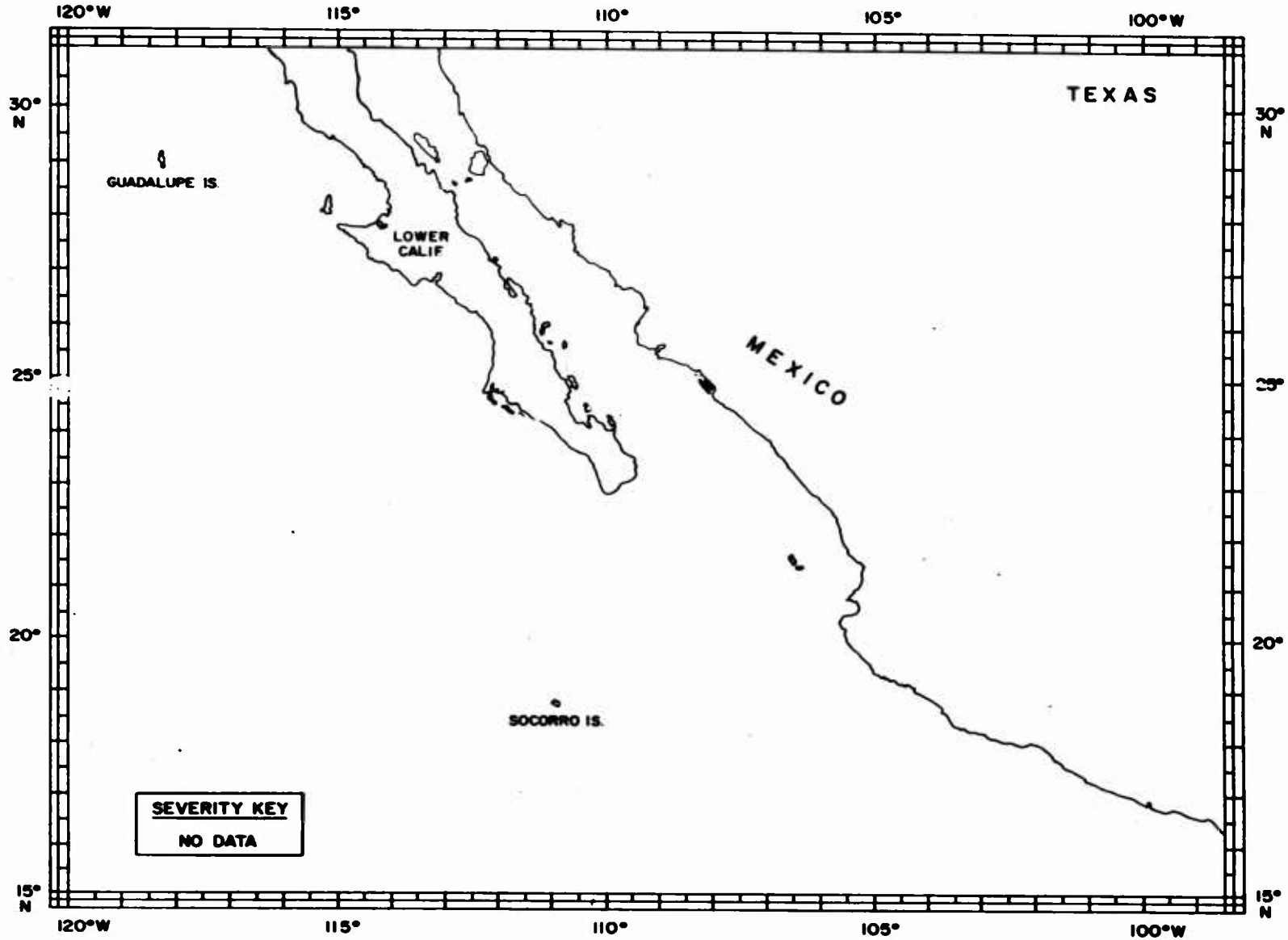

CHART 13 - PACIFIC MEXICO

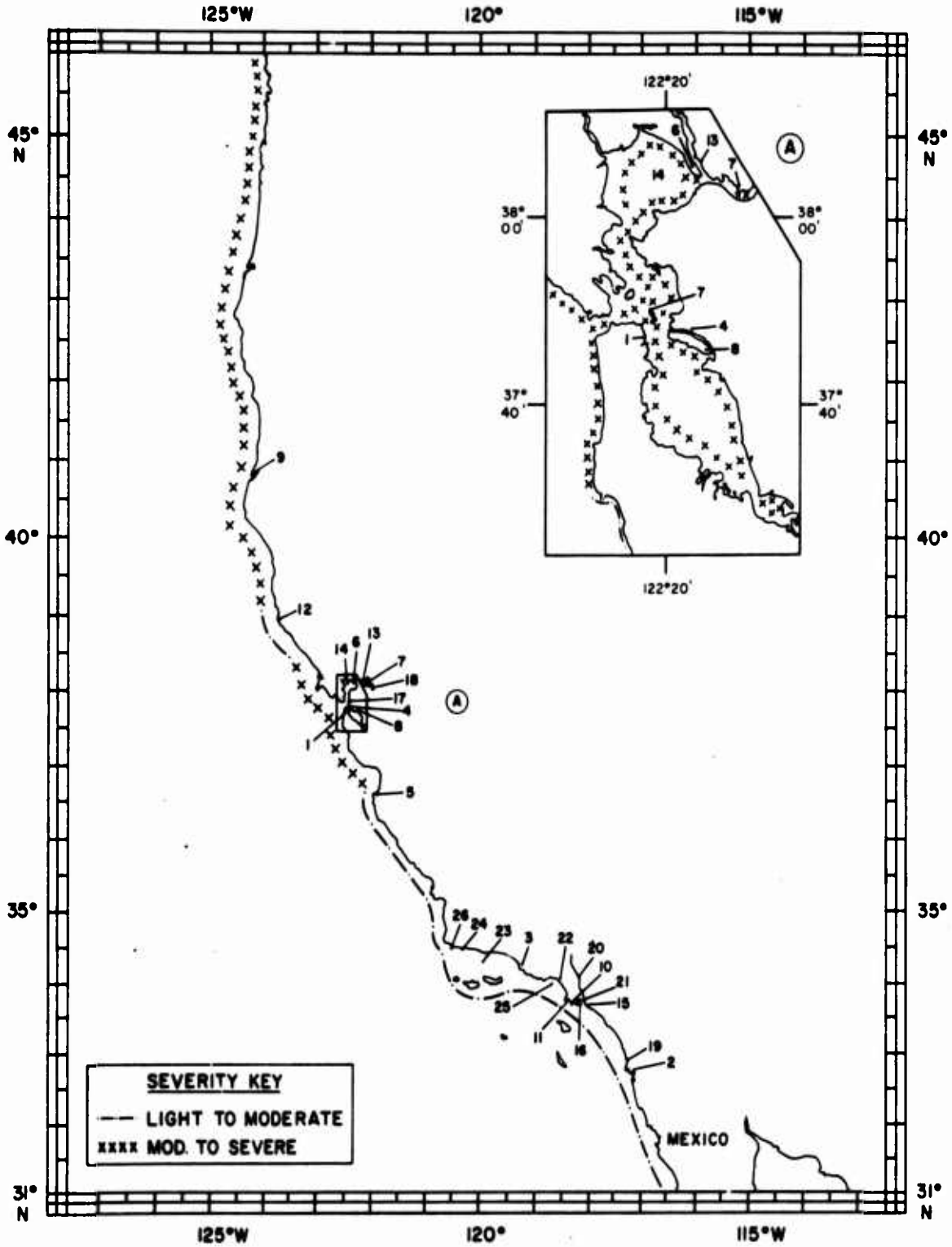

CHART 14 - PACIFIC UNITED STATES

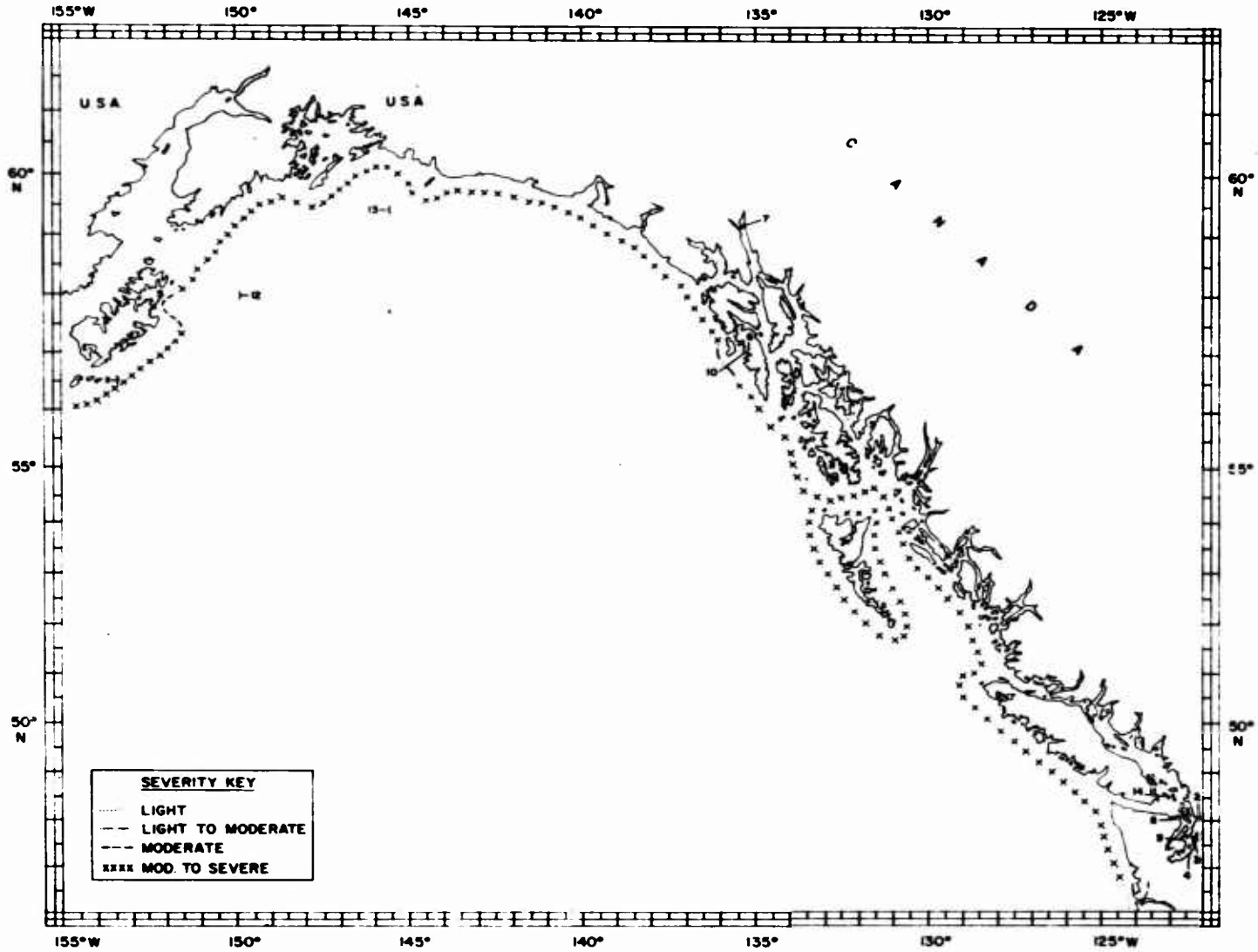

CHART 15 - GULF OF ALASKA

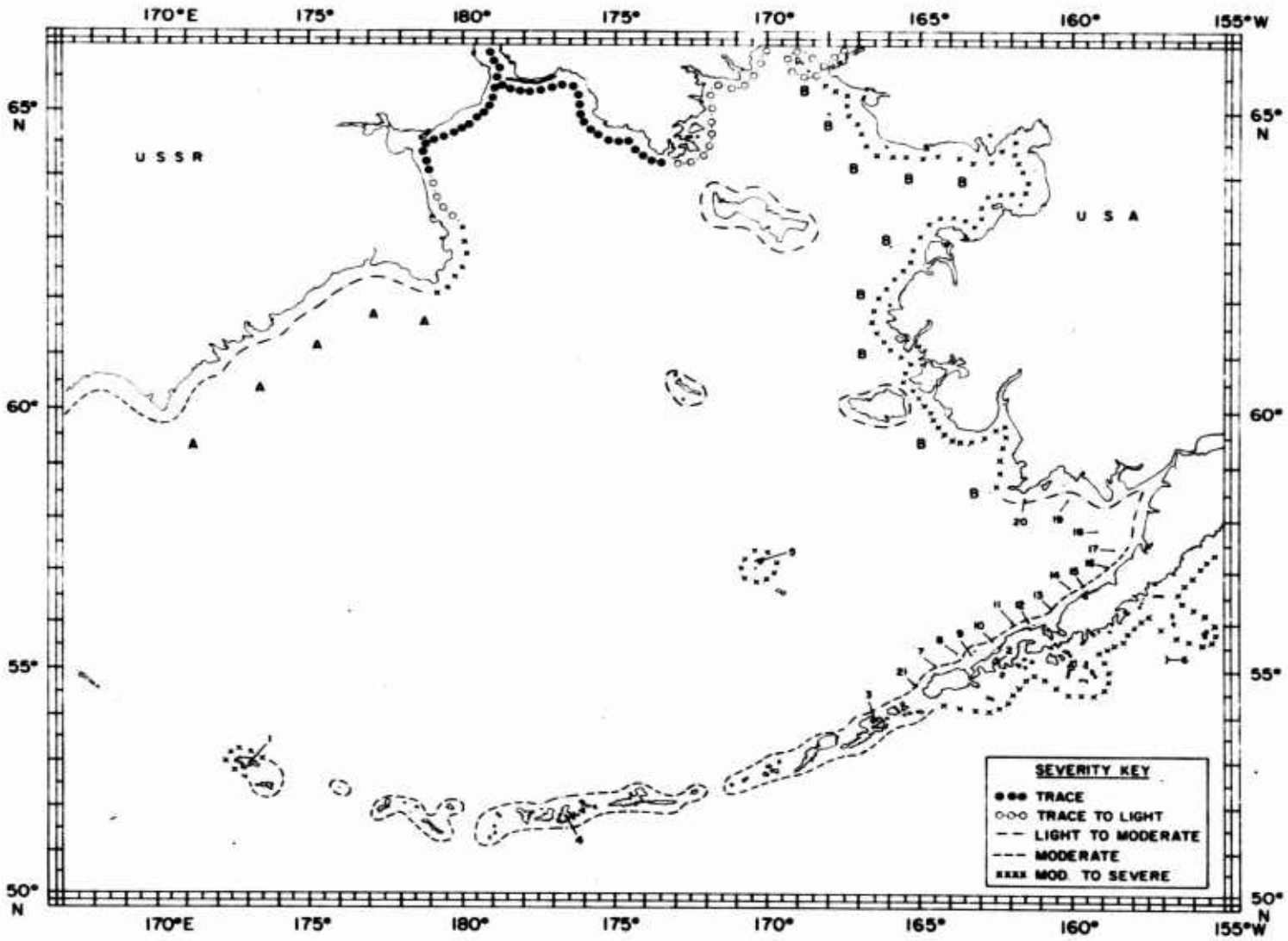

CHART 16 - BERING SEA

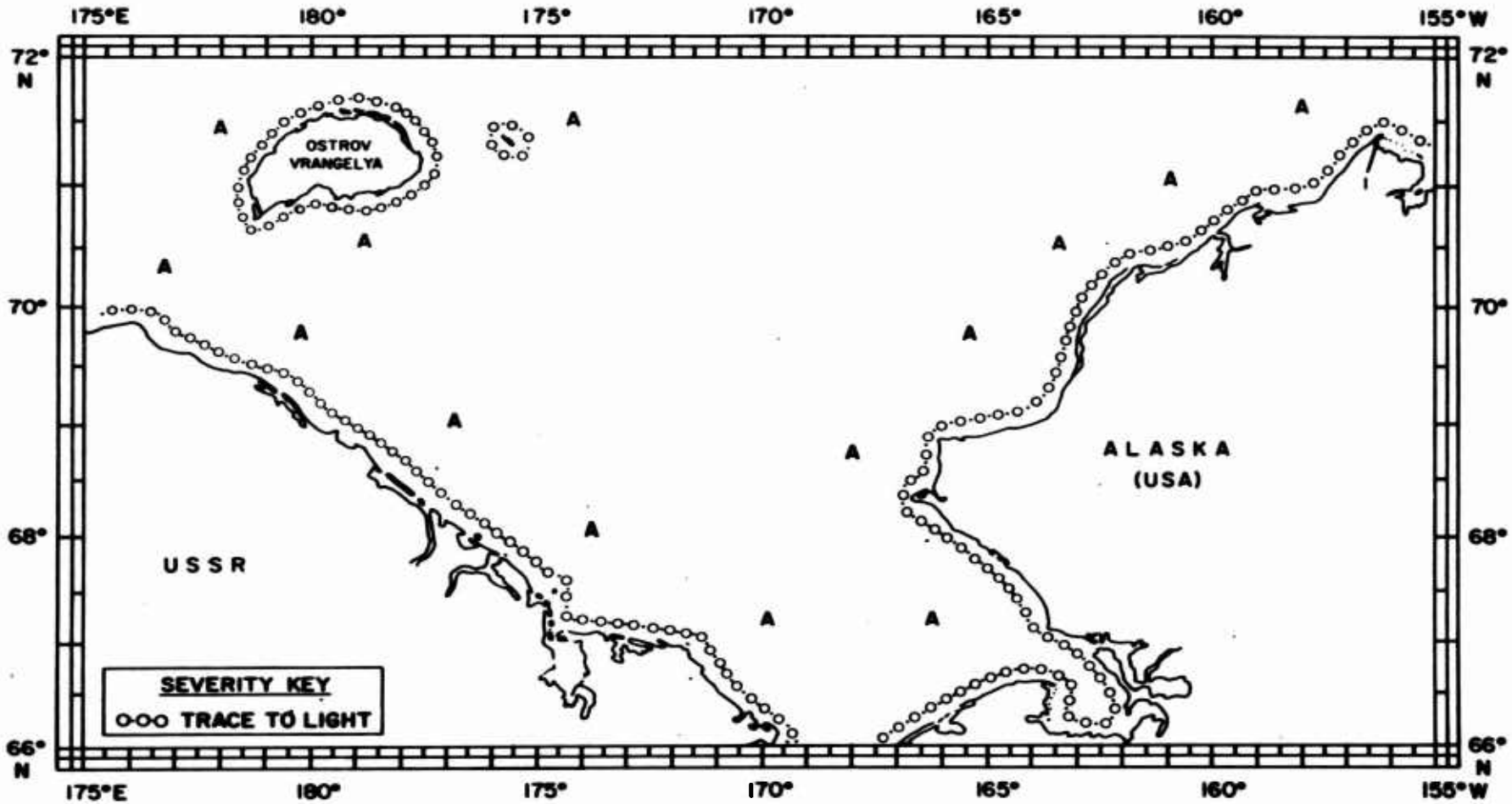

CHART 17 - CHUKCHI SEA

DATA SHEETS

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CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS — MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER	ADDITIONAL INFORMATION
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
1	1	2			3	4		1					
1	A	P			P	P	P	P					PRED. ATT.
1	B	P			P	P	P	P					PRED. ATT.
2	1	1			3	4		2		5	6		MOLS. DOM. BY MUSS.
2	2	P			P	P	P	P		P	P		FOULING THRUOUT YR., BUT INSIGNIFICANT DURING COLD SEASON.
2	3	1			3	4		2		5	6		MOLS. DOM. BY MUSS.
2	4	P			P		P	P		P			STUDY AREA NEAR LAT. 67°N., JUST SO. OF HOLSTEINBORG. COLLECTION DURING JULY. MOLS. INCL. MUSS. MYTILUS & MUDDS.
2	A	4			6	2	1	3		5	7		FOULING INTENSITY PRED.
2	B	4			6	2	1	3		5	7		FOULING INTENSITY PRED.
2	C	3			5	2	1	6		4	P		FOULING INTENSITY PRED.

1 - JAN	7 - JUL
2 - FEB	8 - AUG
3 - MAR	9 - SEP
4 - APR	10 - OCT
5 - MAY	11 - NOV
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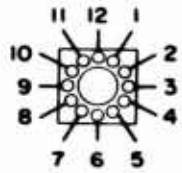

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CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS — MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER	ADDITIONAL INFORMATION
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
3	1							P					MOLS. INCL. MUSS.
3	2							P					MOLS. INCL. MUSS.
3	3	P			P		P	P					MOLS. DOM. BY MUSS.
3	A	3				2	1	5		4	6		FOULING INTENSITY PRED.
3	B					2	1			3	4		FOULING INTENSITY PRED., LOC: N. HUDSON STRAIT.
3	C	3			6	2	1	5		4	7		
3	D	3			6	2	1	5		4	7		
3	E	4			6	2	1	3		5	7		
4	1	2			1	4	3	P				L	ACORN BARNS., GREEN ALG., MOLS. DOM. BY MUSS., E-BRYS.
4	2	2			1		3						ACORN BARNS., GREEN ALG.
4	3				2	3	1					M	ACORN BARNS., E-BRYS.

ADDITIONAL INFORMATION

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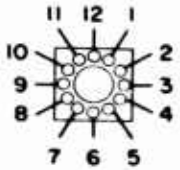

CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS — MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER	ADDITIONAL INFORMATION
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
4	4				2	3	1				4		ACORN BARNS., E-BRYS.
4	5		P		3	5	1	4		P	2	LM	MOLS. DOM. BY MUSS.: MYTILUS, ACORN BARNS., E-BRYS.
4	6	P			1	3	2	4		P	5	LM	ACORN BARNS., E & F-BRYS., GREEN ALG., MOLS. DOM. BY MUSS.: MYTILUS, SITE: PORTSMOUTH NAVAL SHIPYARD.
4	7	P	P	P	P	P	P	P	P	P			MOLS. INCL. MUSS.: MYTILUS & MODIOLUS, SNAILS, JINGLE-SHELLS: ANOMIA, CLAMS & LIMPETS. RED & GREEN ALG., E-BRYS.
4	8	4			5	2	1	3					
4	9	3	4		5	6	1	2		7			
4	10	2			3	6	4	1		5			KELP(P), MOLS. DOM. BY MUSS.: MYTILUS. CALC. TUBES.
4	11	2			4	6	3	1		5			
4	12	4			7	2	1	5		3	6	TL	GREEN ALG., E & F-BRYS., MOLS. DOM. BY MUSS.: MYTILUS & JINGLE-SHELLS: ANOMIA. PANEL DATA. SITE: USN OPERATING BASE.
4	13	P											
4	14	2			4	6	3	1		5		MS	ASBESTOS PANEL DATA: 1943 TO 1944. TUBES. INCL. POLYDORA & LEPIDONOTUS. MOLS. INCL. MYTILUS, ANOMIA & NUCULA., GREEN & BROWN ALG., ECHINUS (P), 5 SP. BRYS., BARNS INCL. BALANUS. SITE: N. SHORE OF EASTERN BAY.
4	15				P	P	1	P		P	P	TL	MOLS. DOM. BY MUSS.: MYTILUS., PANEL DATES: 6.12.44 TO 9.12.45., E-BRYS. SITE: USN SECTION BASE, MT. DESERT IS.

ADDITIONAL INFORMATION

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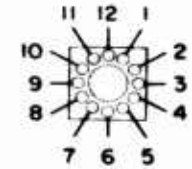

CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS — MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER	ADDITIONAL INFORMATION
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
4	A	4			6	2	1	3		5	7		PRED. M.A.
4	B	3			6	2	1	5		4	7		PRED. M.A.
5	1				1		2					LM	ACORN BARNS.
5	2				1		2	3			4	MS	ACORN BARNS., MOLS. INCL. MUSS.: MYTILUS & SLIPPER-SHELLS: CREPIDULA.
5	3				1	4	3	5			2	LM	E-BRYS., ACORN BARNS., MOLS. INCL. CREPIDULA.
5	4	P	P		2	3	1	P		4		LM	ACORN BARNS. E(M.A. 6-11) & F(M.A. 6-8) BRYS. GREEN ALG. MOLS. INCL. MUSS.: MYTILUS. WOOD PANEL DATES: 8.4.44 TO 5.8.46. SITE: USN AIR STATION. SERPULID TUBES.
5	5	5			1	4	3	2			6	M	ACORN BARNS., MOLS. INCL. MUSS.: MYTILUS, E & F-BRYS., GREEN ALG., PANEL DATA.
5	6		P		2	P	1				3	LM	E-BRYS., ACORN BARNS. WOOD PANEL DATES: 20.7.44 TO ?.12.47. SITE: BAYONNE ANNEX, N.Y. NAVAL SHIPYARD.
5	7				P	P	P	P		P	P		
5	8	P	P		1	3	2	P			4	M	ACORN BARNS. E(M.A. 6-11) & F(M.A. 6-8) BRYS., GREEN ALG., MOLS. INCL. MUSS.: MYTILUS & JINGLE-SHELLS: ANOMIA.
5	9	5			2	4	1	3				MS	ACORN BARNS., E & F-BRYS., GREEN ALG., MOLS. INCL. MUSS.: MYTILUS.

ADDITIONAL INFORMATION

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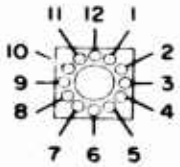

CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS — MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER	ADDITIONAL INFORMATION
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
5	10	4			3	2	1					M	E & F-BRYS., RED (M.A. 6-8) & GREEN (M.A. 3-5) ALG., ACORN BARNS.
5	11	3			2	1	4	5				M	RED (M.A. 6-8) & GREEN (M.A. 1-2) ALG., MOLS. INCL. MUSS.: MYTILUS., E (M.A. 6-11) & F (M.A. 6-11) BRYS.
5	12				1	5	3			4	2	M	ACORN BARNS., E (M.A. 3-5) & F (M.A. 9-11) BRYS., SERPULID TUBES.
5	13				1	3	2	5		P	4	M	MOLS. INCL. MUSS.: MYTILUS (M.A. 3-8) & SLIPPER-SHELLS: CREPIDULA (M.A. 6-11), ACORN BARNS., E (M.A. 6-8) & F (M.A. 6-11) BRYS., SERPULID TUBES.
5	14				1		2					M	
5	15				3	2	1					M	E-BRYS., ACORN BARNS.
5	16	3			4		2	1				S	ACORN BARNS., MOLS. INCL. MUSS., GREEN ALG., PANEL DATA FROM COAST GUARD STATION.
5	17		P		1	P	2	P			3	S	E-BRYS., MOLS. INCL. MUSS.: MYTILUS, ACORN BARNS., WOOD PANEL DATES: 31.5.44 TO 2.10.46. SITE AT FT. LAFAYETTE.
5	18	P	P		2	P	1	3	P		4	TL	MOLS. INCL. MUSS.: MYTILUS, ACORN BARNS., E & F-BRYS., GREEN ALG.
5	19				1		2	3			4	MS	MOLS. INCL. MUSS.: MYTILUS., ACORN BARNS.
5	20				1		2				3	M	ACORN BARNS.
5	21				3	4	2	1		5	6	S	E & F-BRYS., ACORN BARNS., MOLS. INCL. MYTILUS, SERPULID TUBES.

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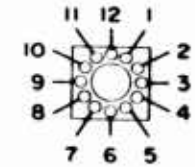

CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS — MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER	ADDITIONAL INFORMATION
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
5	22				1		2					M	ACORN BARNS.
5	23				2			1					MOLS. INCL. MUSS.
5	24				1	3	2			4	5	MS	ACORN BARNS., E-BRYS., SERPULID TUBES.
5	25	P	P	P	P	P	P	P	P	P	P		MOLS. INCL. OYSTERS, MUSS., JINGLE-SHELLS, CLAMS. SOL. & COL. TUNS., E & F-BRYS. AMPHIPOD IS CAPRELLA. 7 SP. SPONGES, 4 SP. BRYS., 3 SP. ALG., 2 SP. ANEMONES, 4 SP. ANNELIDS.
5	26		P		1	4	2	P		5	3	MS	ACORN BARNS, E-BRYS., MOLS. INCL. MUSS.: MYTILUS, OYSTERS: OSTREA, ALSO ANOMIA. WOOD PANEL DATES: 6.7.44 TO 16.12.44. SITE: USN SHIPYARD.
5	27	P			1	3	2	P		5	4	MS	E-BRYS., ACORN BARNS. MOLS INCL. MUSS.: MYTILUS, OYSTERS: OSTREA. WOOD PANEL DATES: 16.6.44 TO 16.12.44. SERPULID TUBES. SITE: USN OPERATING BASE.
5	28	4			3	2	1	5				MS	E-BRYS., GREEN ALG., ACORN BARNS., MOLS. INCL. OYSTERS.
5	29				1	3	2	5		4		MS	ACORN BARNS., E-BRYS., MOLS. INCL. SLIPPER-SHELL: CREPIDULA. SERPULID TUBES.
5	30	4	P	P	1	2	3	P	P	P	5	MS	E-BRYS., ACORN BARNS., GREEN ALG., ISOPODS (P), TUNS. ARE MOLGULA. 3 SP. TUBES INCL. POLYDORA, 5 SP. BRYS., 5 SP. MOLS., STUDY DATES: 4 TO 12.63 & 4 TO 12.64. 2.5 M DEPTH.
5	31				2		1					M	ACORN BARNS.
5	32				1	2	3					MS	E-BRYS., ACORN BARNS.
5	33				1	3	2	4				S	F-BRYS., MOLS. INCL. MUSS.: MYTILUS, ACORN BARNS. DATA FROM 3 SITES ON JAMES RIVER.

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CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS — MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER	ADDITIONAL INFORMATION
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
5	34	P			P		P	P					
5	35				1		2	3		4		LM	MOLS. INCL. MUSS.: MYTILUS, ACORN BARNS., SERPULID TUBES.
5	36				1	3	2	4		6	5	M	MOLS. INCL. MUSS.: MYTILUS., JINGLE-SHELLS: ANOMIA, OYSTERS: OSTREA, E&F-BRYS., SERPULID TUBES., WOOD PANEL DATA: 1.7.44 TO ?.12.47. DATA FROM 5 SITES.
5	37				1		2	3				MS	MOLS. INCL. MUSS.: MYTILUS ACORN BARNS. DATA FROM 2 SITES.
5	38				1	3	2	5		4		M	ACORN BARNS., F-BRYS., MOLS. INCL. OYSTERS., SERPULID TUBES.
5	39				1	2				3		LM	E(M.A.6-8) & F(M.A.3-5) BRYS., ACORN BARNS., SERPULID TUBES.
5	40				1	3	2					M	E-BRYS., ACORN BARNS.
5	41	3			2	4	1				5	M	ACORN BARNS., GREEN ALG., E & F-BRYS.
5	42				1		2					M	SITE ON HUDSON RIVER.
5	43	1			5	3	4	P		2		M	GREEN, RED & BROWN ALG., E(M.A.9-11) & F(M.A.3-5)-BRYS., MOLS. INCL. ANOMIA & OSTREA, ACORN BARNS., SERPULID TUBES. WOOD PANEL DATA: ?.12.47 FROM 19.2.46. SITE: SMALL INLET SO. OF HAMILTON.
5	44	P					P					M	OILY SILT. HIGH POLLUTION FACTOR, GREEN & BROWN ALG., LOW SALINITY. WOOD PANEL DATA: 17.7.44 TO 17.3.47. SITE: PHILADELPHIA NAVAL SHIPYARD AT DELAWARE & SCHUYLKILL RIVERS.
5	45		P		1	P	2	P			P	LM	MOLS. INCL. MUSS.: MYTILUS., E-BRYS. WOOD PANEL DATA: 31.8.44 TO 1.6.46. SITE: USN STATION — 14 M; SO. OF SAVANNAH, GA. NEAR RIVER MOUTH.

CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS — MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER	ADDITIONAL INFORMATION
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
5	46		P		P	P	P	P	P	P	P		MOLS. INCL. OSTREA, MODIOLUS, MYTILUS, ANOMIA. ISOPODS (P), ECHINS. (P), E&F-BRYS., TUNS. ARE STYELA., 51 SP. HYDROIDS, 6 SP. SPONGES, 6 SP. BARNS., GLASS, WOOD, TILE PANEL DATES: ?.3.41 TO ?.2.42.
5	47	3	3	2	1	1	2	2	2	1	1	MS	ISOPODS (REL. AB. 3), E-BRYS., GREEN ALG., ACORN BARNS., OYSTERS INCL. CRASSOSTREA, TUBES. INCL. POLYDORA, 4 SP. BRYS., 2 SP. TUBES., LM FOULING., 2M DEPTH. STUDY DATES: 12 TO 4.63 & 12 TO 4.64
5	48	3	1	1	1	1	1	2	3	2	1		ISOPODS (P), MOLS. MUSS. & OYSTERS: OSTREA & CRASSOSTREA, TUNS. MOLGULA 1 SP. SPONGE. STUDY DATES: 12 TO 4.63 & 12 TO 4.64. DEPTH: 7M.
5	49	3	1	1	1	1	1	2		2	1		MOLS. INCL. MUSS., 4 SP. BRYS., TUNS. ARE MOLGOLA, 2M. DEPTH. STUDY DATES: 12 TO 4.63 & 12 TO 4.64.
5	50	3	1	2	1	1	1	2		3	2		3 SP. E&F-BRYS., MOLS. INCL. MUSS., 3M. DEPTH., STUDY DATES: 12 TO 4.63 & 12 TO 4.64.
5	51	3	1		1	2	1	2		3			MOLS. INCL. MUSS., E&F-BRYS. (2 SP.), 3M. DEPTH., STUDY DATES: 12 TO 4.63 & 12 TO 4.64.
6	1				1	2	5	3			4		
6	2				1	3	2	4			5		MOLS. DOM. BY OYSTERS.
6	3				1	2	3	4					MOLS. DOM. BY OYSTERS.
6	4			3	1		4	2		5			MOLS. DOM. BY MUSS. & OYSTERS, GASTS. (P). PLASTIC FLOAT SYSTEM USED. SITE WAS 2 MI OFFSHORE MOUTH OF ST. ANDREWS BAY, FLA. DEPTH: 60 FT. LOC. LAT. 85°46'36" N, LONG. 30° 07' 04" W.
6	5	P			1	3	2	5	P	4	P		MOLS. DOM. BY OYSTERS: OSTREA & MUSS.: MYTILUS, THEN JINGLE-SHELLS: ANOMIA., E&F-BRYS. WOOD PANEL DATES: 22.7.44 TO ?.12.47. SITE WAS: USN AIR COMMAND.

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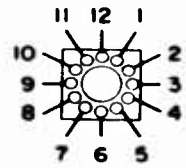

CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS — MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER	ADDITIONAL INFORMATION
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
6	6				1		2	4		3			MOLS. DOM. BY MUSS. DATA FROM 3 SITES.
6	7	2	P		P	3	1	P		4	P	LM	RED & GREEN ALG., E & F-BRYS., MOLS. INCL. JINGLE-SHELLS: ANOMIA. DATA FROM 2 STATIONS. SITE: USN STATION. WOOD PANELS: 7.6.44 TO ?.12.47.
6	8				1	3	2	4		5			MOLS. DOM. BY MUSS.
6	9	5			1	2	3			4			GREEN ALG.
6	10	6			1	2	5	4		3	6	TL	MOLS. DOM. BY MUSS.: MYTILUS & OYSTERS: OSTREA, ANOMIA (P), E & F-BRYS. UNTREATED WOOD PANEL DATA: 1942 TO 1943. SITE: POINCE DE LEON INLET.
6	11	5			1	2	6	5		4	3		E & F-BRYS., SOL. & COL. TUNS., MOLS. INCL. JINGLE-SHELLS: ANOMIA & OYSTERS: OSTREA. RED & GREEN ALG. GLASS PANEL DATA FROM 3 SITES. 165 DAYS IMMERSION.
6	12				1	3	2						
6	13				2		1	3					MOLS. DOM. BY OYSTERS.
6	14				1	2	4			3			
6	15	P			1	2	3	P		P	P	LM	GREEN ALG., MOLS. INCL. OYSTERS: OSTREA & JINGLE-SHELLS: ANOMIA, E-BRYS. WOOD PANEL DATA FROM USN BASE: 21.7.44 TO 15.7.46.
6	16	6			1	3	2	5	T	4		LM	GREEN ALG., E & F-BRYS., MOLS. INCL. JINGLE-SHELLS: ANOMIA & MUSS.: MYTILUS, & OYSTERS: OSTREA. WOOD PANEL DATA: 10.6.44 TO ?.12.44. SITE: USN STATION.
6	17	1			3		2						

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5 - MAY	11 - NOV
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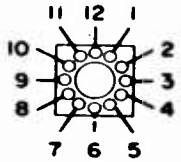

CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS — MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER	ADDITIONAL INFORMATION
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
6	18				1								SITE WITHIN TIDAL ZONE.
6	19	5			1	3				4	2		M.A. PRED.
6	20				1	3	2	5		4		LM	E&F-BRYS., MOLS. INCL. MUSS.: MYTILUS, JINGLE-SHELLS: ANOMIA, OYSTERS: OSTREA. WOOD PANEL DATA: 8.6.44 TO ?.12.47. SITE: USCG TRAINING STATION ON ST. JOHN'S RIVER, 22 MI. FROM JACKSONVILLE, FLA.
6	21	P	P		P	P	P	P	P	P	P		CORAL (P), E&F-BRYS., RED, BROWN & GREEN ALG., MOLS. INCL. MIXED PELS. & GASTS. PINE & ASBESTOS PANEL DATA: ?.9.61 TO ?.9.62. PEAK FOULING AT 27 M. SITE: 2 MI. EA. OF FT. LAUDERDALE, FLA.
6	22	P	1	P	1	P	1	P		P			GREEN ALG., E-BRYS., MOLS. INCL. OSTREA, CRASSOSTREA & ARCA, CORAL (P) & IS ASTRANGIA. STUDY DATES: 5.4.46 TO 12.2.50. SITE: LOUISIANA TOWER. DEPTH: 50 FT LOC. 15 MI. SE. OF BARATARIA PASS.
6	23	P	P		P			P					ECOLOGICAL STUDY, ORGANISMS ONLY NOTED. STUDY DATES: 1950 TO 1953. INCL. ALAZAN BAY, TEXAS.
6	24	P	P		P			P		P			GREEN ALG., HYDROZOANS (P), ISOPODS (P), MOLS. INCL. PELS. & GASTS. SITE: JUST N. OF BAFFIN BAY, TEXAS.
6	25	P	P	P	P	P	P	P		P			MUD BOTTOM. E-BRYS., MOLS. INCL. OSTREA, CRASSOSTREA & ARCA. TEXAS TOWER SITE 10.6 MI ENE OF FREEPORT, TEXAS & 4 MI SO. OF OYSTER BAY. STUDY DATES: 1.7.48 TO 5.7.49.
6	26	P	P	P	P	P	P	P		P			GREEN ALG., CORAL: ASTRANGIA (P), E-BRYS., MOLS. INCL. OSTREA & CREPIDULA. 60 FT. DEPTH. STUDY DATES: 20.7.48 TO 17.7.49. SITE: TEXAS TOWER, 6 MI. FROM FREEPORT.
6	27	P			P	P		P					E-BRYS., MOLS. INCL. PELS., BUT NO OYSTERS. 38 FT. DEPTH. LOUISIANA TOWER SITE, 7 MI. SE OF QUATRE BAYOU PASS.
7	1	1			2		3						

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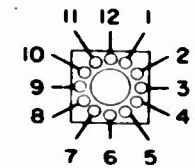

CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS — MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER	ADDITIONAL INFORMATION
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
7	2	6			1	4	3	7	8	2	5	M	GREEN ALG., E&F-BRYS., MOLS. INCL. JINGLE-SHELLS: ANOMIA, MUSS.: MYTILUS & OYSTERS: OSTREA. WOOD PANEL DATA: 21.9.44 TO ? 12.47. SITE: USN AIR STATION.
7	3	1					2						
7	4	2			4	1	3			5			
7	5	7			2	3	1	5	8	4	6	LM	MOLS. DOM. BY OYSTERS: OSTREA & INCL. JINGLE-SHELLS: ANOMIA, RED ALG., E&F-BRYS., WOOD PANEL DATA: 20.6.44 TO ? 12.47. SITE: USN BASE.
7	6	P			1	3	2	4	P	5	P	MS	GREEN ALG., E&F-BRYS., MOLS. INCL. OYSTERS: OSTREA, MUSS.: MYTILUS & JINGLE-SHELLS ANOMIA, ALSO BARNACLES: BALANUS(P). WOOD PANEL DATES: 16.8.44 TO ? 12.47. SITE: USN BASE.
7	7	P			P	P	P		P	P			
7	8	5			3	2	1	4	8	6	7	LM	E&F-BRYS., MOLS. INCL. OYSTERS: OSTREA & JINGLE-SHELLS: ANOMIA, GREEN & RED ALG. WOOD PANEL DATA: 1.7.44 TO ? 4.47. SITE: USN BASE.
7	9	2			7	4	5	6	3	1			MOLS. DOM. BY OYSTERS: CRASSOSTREA, E&F-BRYS., STUDY DATES: 14.1.64 TO 14.1.65.
8	1	6			1	5		2		4	3		MOLS. DOM. BY MUSS., UNIFORM GROWTH THRUOUT YR.
8	2	P			P	P	P	P	P	P	P		
8	3	P			P	P	P	P	P	P	P		

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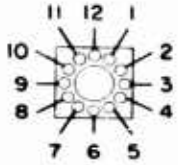

CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS — MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER	ADDITIONAL INFORMATION
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
8	4	P			P	P	P	P	P	P			
8	5				2	3	1	5		4	6		MOLS. DOM. BY MUSS., E & F-BRYS.
8	6	6			1	2	4	7		5	3		
8	7	6			1	2	4	7		5	3		
8	8				2	3	1	5	7	4	6	LM	E & F-BRYS., MOLS. DOM. BY MUSS. & INCL. JINGLE-SHELLS: ANOMIA, OYSTERS: OSTREA, SCALLOPS: PECTIN, E-SPONGES, GREEN & RED ALG. WOOD PANEL DATA: ? 6.44 TO ? 6.45. SITE: USN FACILITY.
8	9	6			1	5		2		4	3		UNIFORM GROWTH THRUOUT YR.
9	1	P			P	P	P	P		P			
9	2	2			3	2	2	4		1			MOLS. DOM. BY SLIPPER-SHELLS: CREPIDULA, LM FOULING, E & F-BRYS. WOOD PANEL DATA: 25.2.64 TO ? LOC.: LAT. 54°49'S, LONG. 68°18'W.
9	3	4				3	2	6	6	5	1		MOLS. DOM. BY MUSS.: MYTILUS, E & F-BRYS., WOOD PANEL DATA: 18.11.63 TO ? LOC.: LAT. 42°46'S, LONG. 65°01'W.
9	4				2	1	3			2	2		E & F-BRYS., WOOD PANEL DATA: 27.11.63 TO ? LOC.: LAT. 38°58'S, LONG. 62°05'W.
9	5	4			4	1	3			2			MOLS. DOM. BY MUSS., THEN CHITONS, E-BRYS., SERIES OF WOOD PANELS. STUDY DATES: 12.12.63 TO 30.12.64. LOC.: LAT. 38°35'05"S, LONG. 58°40'05"W.

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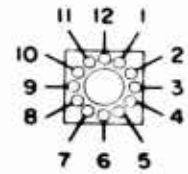

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		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
9	6				4	1	3			2			E-BRYS., SERIES OF WOOD PANELS. STUDY DATES: 21.2.63 TO 7.2.64 LOC.: LAT. 38° 35' S; LONG. 58° 42' W.
9	7	3				1	4		5	2	4		E-BRYS. WOOD PANEL DATA: 6.2.64 TO 10.5.66 LOC.: LAT. 47° 46' S; LONG. 65° 64' W.
9	8				1	2	4			3			E-BRYS., WOOD PANEL DATA: 8.12.63 TO ? LOC.: LAT. 36° 18' S; LONG. 56° 47' W.
9	A	6			2	5	3	1			4		MOLS. DOM. BY MUSS., THEN OYSTERS. OPTIMUM GROWING SEASON 12 TO 4.
9	B	6			2	T	4	1	8	5	3		MOLS. DOM. BY MUSS.
9	C	6			2	5	4	1	T		3		MOLS. DOM. BY MUSS.
9	D	6			2	T	5	1	8	3	4		MOLS. DOM. BY MUSS.
9	E				3	T	4	2	5	1	6		MOLS. DOM. BY MUSS. & OYSTERS. OPTIMUM GROWING SEASON 12 TO 4
10	A	T			1	3	4	2		5	6		MOLS. DOM. BY OYSTERS & MUSS.
10	B	6			2	5	3	1			4		MOLS. DOM. BY MUSS., THEN OYSTERS.
10	C	6			2	5	3	1			4		MOLS. DOM. BY MUSS., THEN OYSTERS.

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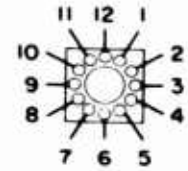

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		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
11	A	8			2	6	5		3	1	7		CORAL IS 4th IN REL. AB.
11	B				2	5	6	1		3			MOLS. DOM. BY OYSTERS, THEN MUSS., THEN JINGLE-SHELLS. CORAL IS 4th IN REL. AB.
11	C	7			1	3	4	2		5	6		MOLS. DOM. BY MUSS., THEN OYSTERS.
12	1	6			1	3	5	4	7	2	8	LM	MOLS. DOM. BY OYSTERS. OSTREA &. JINGLE-SHELLS: ANOMIA. GREEN & BROWN ALG. E&F. BRYS, E-SPONGES, VERMETIDS (P), BRACHIOPODS (P), WOOD PANELS: 15.6.44 TO ?12.47. SITE: USN STATION.
12	2	7			1	4	3	5		2	6		SITE: FT. SHERMAN AREA.
12	3				4	1	2	5		3			MOLS. DOM. BY OYSTERS, THEN CLAMS. OFFSHORE SITE AT 50 FT. DEPTH.
12	4				2	1	4			3			
13													NO DATA.
14	1	4	5		1	3	2	6			7	LM	ACORN BARNS., MOLS. INCL. OYSTERS: OSTREA, MUSS.: MYTILUS, & JINGLE-SHELLS: ANOMIA. GREEN ALG. WOOD PANEL DATA: 12.8.44 TO ?12.47. SITE: USN SHIPYARD: HUNTER'S POINT.

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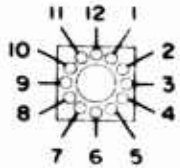

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		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
14	2	6	7		4	2	1	8		3	5	M	ACORN BARNS., E & F-BRYS., MOLS. INCL. MUSS.: MYTILUS & SCALLOPS: PECTIN, SERPULID TUBES. PANEL DATA DATES: 17.7.44 TO 7.12.47. SITE: USN STATION.
14	3	4	6		5	2	1	7		3	8	M	MOLS. INCL. MUSS.: MYTILUS, JUGULE-SHELLS: ANOMIA & SCALLOPS: PECTIN., ACORN BARNS., E & F-BRYS., GREEN ALG., SERPULID TUBES. PANEL DATA DATES: 15.6.44 TO 7.12.47. SITE: USN STATION.
14	4	P	P		P		P	P		P		M	ISOPODS (P)-(M.A.1-7), MOLS. INCL. MUSS.: MYTILUS. WOOD PANEL DATA DATES: 7.12.40 TO 7.12.42. SITE: OAKLAND ESTUARY.
14	5	9	8		5	1	6	3	4	2	7	M	PROTOZOA (P)-(M.A.1-10), GREEN ALG., E & F-BRYS., RED & BROWN ALG., ACORN BARNS. WOOD PANEL DATA: 1.10.66 TO 1.10.67. ECHINUS (P)-(M.A.1-9). SITE LONG HARBOR AREA.
14	6				1	3	2	4				M	ACORN BARNS., E-BRYS., MOLS. INCL. MUSS.: MYTILUS.
14	7				1		2	3				M	MOLS. INCL. MUSS.: MYTILUS, ACORN BARNS.
14	8	3			1		2	4				M	GREEN ALG., ACORN BARNS., MOLS. INCL. MUSS.: MYTILUS.
14	9	3			1	5	2	4					GREEN ALG., MOLS. DOM. BY MUSS.: MYTILUS, F-BRYS., ACORN BARNS.
14	10		4		3	P		2		1	P		SEA-WEES., AUTHEDONIA (P), HYDROIDS (P)-(M.A.12-5), BRYS. INCL. BUGULA. WOOD PANEL DATA. SITE: HARBOR AREA.
14	11	6	7		3	2	1	5		4	8	MS	GREEN ALG., E & F-BRYS., MOLS. INCL. MUSS.: MYTILUS & MODIOLUS, JUGULE-SHELLS: ANOMIA, SCALLOPS: PECTIN. PANEL DATA DATES: 14.6.44 TO 7.12.47. SITE: TERMINAL ISLAND NAVAL SHIPYARD.
14	12	1			2	3	4						ALG. DOM. BY GREEN, THEN RED., E-BRYS.
14	13	5	6		1	4	2	3			7	LM	LIM FOULING, GREEN ALG., E & F-BRYS., MOLS. INCL. MUSS.: MYTILUS. PANEL DATA DATES: 20.6.44 TO 7.12.47. SITE: USN SHIPYARD.

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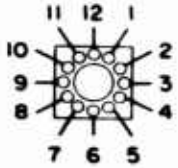

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		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
14	14				P	P	P	P					BUOY DATA.
14	15				4	1	3	5		2		M	ACORN BARNS., E&F-BRYS., MOLS. INCL. MUSS.: MYTILUS. SERPULID TUBES.
14	16				2	1	3	5		4		S	E&F-BRYS., ACORN BARNS., MOLS. INCL. MUSS.: MYTILUS. SERPULID TUBES.
14	17				1	2	3	4				MS	ACORN BARNS., E&F-BRYS., MOLS. INCL. MUSS.: MYTILUS. ISLAND ALSO KNOWN AS YERBA BUENA. SAN FRANCISCO BAY AREA.
14	18	4	6		1	5	2	3				MS	E&F-BRYS., ISOPODS (P), MOLS. INCL. MUSS.: MYTILUS, GREEN ALG., WOOD PANEL DATA DATES: 3.1.45 TO 7.12.47. SITE: USN MAGAZINE, W. OF SUISUN BAY.
14	19	P	P		P	P	P	P	P	P	P		WOOD, CEMENT & GLASS PANELS. STUDY DATES: 7.10.26 TO 7.10.35. SITE: SCRIPPS PIER.
14	20	P	P	P	3	P		1		2	P		SOL-TUNS., BRYO.: BUGULA, HYDROZOAN: OBELIA (P)-(M.A. 12-5), GREEN ALG., MOLS. INCL. MUSS.: MYTILUS (M.A. 3-5), CLAMS & LIMPETS. CHITONS (P). WOOD PANEL DATA. SITE IN HARBOR AREA.
14	21				2			3		1			DATA FROM 8 STATIONS. STUDY DATES: 7.6.56 TO 7.8.59. SITE AT MOUTH OF SAN GABRIEL RIVER.
14	22							P					MOLS. INCL. MUSS. STUDY IN 1952. LOC: LAT. 34°N, LONG. 118° 30'W.
14	23	P						P		P			SHELF STUDY., MOLS. INCL. CLAMS, NUDIS., & CHITONS. ECHINUS (P).
14	24	P						P		P			MOLS. INCL. NUDIS, CLAMS & CHITONS. ECHINUS (P). SHELF STUDY.
14	25	P						P		P			ECHINUS (P)., MOLS. INCL. CHITONS, NUDIS., & CLAMS. SHELF STUDY.

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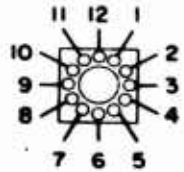

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		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
14	26	P						P		P			SHELF STUDY. ECHINS. (P), MOLS. INCL. NUDIS. (GASTS.), CLAMS (PELS.) & CHITONS.
15	1		2		3		1					M	ACORN BARNS., PANEL DATA DATES: 18.7.44 TO 12.2.46. SITE: USN STATION AT TONGUE POINT.
15	2				1		2	3				LM	ACORN BARNS., MOLS. DOM. BY MUSS.: MYTILUS.
15	3	4			2	3	1	6		5	7	LM	E&F-BRYS., GREEN ALG., ACORN BARNS., MOLS. INCL. MUSS.: MYTILUS, SERPULID TUBES. PANEL DATA DATES: 15.6.44 TO ?12.47.
15	4				1	3	2			4		L	E&F-BRYS., ACORN BARNS. WOOD PANEL DATA: 15.9.44 TO 14.3.46. SITE: TODD PACIFIC SHIPYARD.
15	5	7			2	3	1	5		4	6	LM	GREEN, RED & BROWN ALG., E&F-BRYS., MOLS. INCL. JINGLE-SHELLS: ANOMIA, & MUSS.: MYTILUS. PANEL DATA DATES: 15.7.44 TO ?12.47. SITE: ST. PAUL HARBOR, WOMEN'S BAY.
15	6	4	6		5	2	1	7		3		TL	E&F-BRYS., RED, BROWN & GREEN ALG., MOLS. INCL. MUSS.: MYTILUS & JINGLE-SHELLS: ANOMIA. PANEL DATA DATES: 15.11.44 TO 16.8.46. SITE: HARBOR ISLAND, SITKA HARBOR.
15	7							P					MOLS. DOM. BY MUSS.
15	8	4			1	3	2	7		5	6	TL	LM FOULING. GREEN ALG., E&F-BRYS., MOLS. INCL. ANOMIA & MYTILUS. PANEL DATA DATES: 18.7.44 TO ?12.47. SITE: HADLOCK AREA, USN FACILITY.
15	9	5			2	3	1	4	8	6	7	LM	GREEN ALG., E&F-BRYS., MOLS. INCL. MUSS: MYTILUS. WOOD PANEL DATA DATES: 16.6.44 TO ?12.47. SITE: PUGET SOUND SHIPYARD, SINCLAIR INLET.
15	10			P				P					MOLS. INCL. MUSS. STUDY BEGUN IN 1952. LOC.: LAT. 51°03'N; LONG. 135°20'W.

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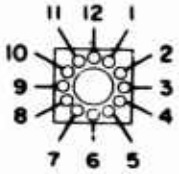

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		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
15	11			P	P	P	P	P	P	P			SILTY-SAND BOTTOM. ECHINS.(P). MOLS. INCL. CLAMS. LOC.: LAT. 56°30'N.; LONG. 153°30'W.
15	12				P			P					ECHINS.(P)., MOLS. INCL. CLAMS. LOC.: LAT. 58°N; LONG. 150°W.
15	13									P			GREY OOZE SEDIMENT. ECHINS.(P). SITE: LAT. 59°30'N; LONG. 145°30'W.
15	14				3	1				2			E & F-BRYS., TUBES. ARE SPIROBIS.
16	1				1	4	2	3					SITE: MASSACRE BAY AREA.
16	2				1		2						
16	3	4			3	1	2	6		5		L	M.A. PRED., GREEN & BROWN ALG., E & F-BRYS., MOLS. DOM. BY MUSS.: MYTILUS & MODIOLUS. WOOD PANEL DATA: 1.7.44 TO 1.8.47. SITE: N. SIDE OF UNALASKA IS.
16	4	3			2		1			4		TL	M.A. PRED. WOOD PANEL DATA: 15.7.44 TO ? 12.47. SITE: KULUK BAY AREA.
16	5	2			1	3	5	4					
16	6							P		P	P		BRACHIOPODS (P). LOC.: LAT. 55°15'N; LONG. 157°W.
16	7	P		P	P			P	P	P	P		SAND BOTTOM. INTENSITY & M.A. PRED. STUDY DATES: 1958 TO 1959. MOLS. INCL. GASTS. & PELS., ECHINS.(P).

ADDITIONAL INFORMATION

1 - JAN
2 - FEB
3 - MAR
4 - APR
5 - MAY
6 - JUN
7 - JUL
8 - AUG
9 - SEP
10 - OCT
11 - NOV
12 - DEC

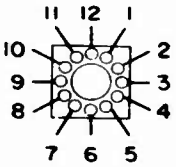

CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS — MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER	ADDITIONAL INFORMATION
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
16	8	P		P	P			P	P	P			SANDY-GRAVEL BOTTOM. STUDY DATES: 1958 TO 1969. INTENSITY & M.A. PRED. ECHINS.(P). MOLS. INCL. GASTS. & MUSS.: MODIOLUS.
16	9	P	P	P	P			P	P		P		SANDY BOTTOM. INTENSITY & M.A. PRED., STUDY DATES: 1958 TO 1969., MOLS. INCL. PELS. & GASTS., COL. TUNS.
16	10	P	P	P	P			P	P		P		SAND BOTTOM. STUDY FROM 1958 TO 1969. INTENSITY & M.A. PRED. MOLS. INCL. GASTS. & PELS. ECHINS.(P), COL. TUNS.
16	11	P		P	P			P	P	P			SANDY-MUD BOTTOM. INTENSITY & M.A. PRED. STUDY DATES: 1958 TO 1969. MOLS. INCL. PELS. & GASTS., ECHINS.(P).
16	12	P		P	P			P	P	P	P		INTENSITY & M.A. PRED. STUDY DATES: 1958 TO 1969. MOLS. INCL. MUSS.: MODIOLUS, OTHER PELS. & ALSO GASTS. SCL. & COL. TUNS.
16	13	P	P		P	P	P	P	P	P	P		SANDY BOTTOM. INTENSITY & M.A. PRED. STUDY DATES: 1958 TO 1969. MOLS. INCL. GASTS.: MYTILUS, OTHER PELS., ALSO GASTS. COL. TUNS., ECHINS.(P), CORAL (P).
16	14	P			P	P	P	P		P	P		INTENSITY & M.A. PRED. STUDY DATES: 1958 TO 1969. CORAL (P), ECHINS. (P), SCL. & COL. TUNS.
16	15	P			P			P	P	P	P		STUDY DATES: 1958 TO 1969, INTENSITY & M.A. PRED. MOLS. INCL. GASTS., ECHINS.(P), CORALS (P), COL. TUNS.
16	16	P			P		P	P			P		INTENSITY & M.A. PRED. STUDY FROM 1958 TO 1969. ECHINS.(P)., SCL. TUNS., MOLS. GASTS. & PELS.
16	17	P			P		P	P		P	P		SCL. & COL. TUNS., M.A. & INTENSITY PRED. STUDY DATES: 1958 TO 1969, ECHINS.(P). MOLS. INCL. PELS. & GASTS.
16	18	P			P			P			P		M.A. & INTENSITY PRED., STUDY DATES: 1958 TO 1969., SCL. TUNS., MOLS. INCL. PELS. ECHINS.(P).
16	19	P			P		P	P	P		P		STUDY DATES: 1958 TO 1969. INTENSITY & M.A. PRED., MOLS. INCL. GASTS. & PELS. ECHINS.(P), CORALS (P), SCL. & COL. TUNS.

1 - JAN
2 - FEB
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7 - JUL
8 - AUG
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10 - OCT
11 - NOV
12 - DEC

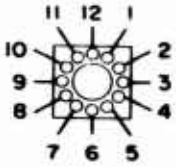
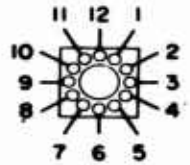


CHART NUMBER	LOCATION NUMBER	FOULING ORGANISMS — MONTH(S) OF MAXIMUM ATTACHMENT, RELATIVE ABUNDANCE, PRESENCE (P)										SILT COVER	ADDITIONAL INFORMATION
		ALGAE	AMPHIPODS	ANEMONES	BARNACLES	BRYOZOANS	HYDROIDS	MOLLUSCS	SPONGES	TUBEWORMS	TUNICATES		
16	20	P		P	P			P	P		P		INTENSITY & M.A. PRED., STUDY DATES: 1968 TO 1969. ECHIUS. (P), CORALS (P), MOLS. INCL. GASTS. & PELS., SOL. & COL. TUNS.
16	21	P			P		P	P	P	P	P		SANDY BOTTOM. STUDY FROM 1968 TO 1969. M.A. & INTENSITY PRED., MOLS. INCL. MUSS.: MODIOLUS, OTHER PELS., & GASTS., ECHIUS. (P), CORALS (P), ISOPODS (P).
16	A	P			P	P	P	P	P				PRED. INTENSITY.
16	B	P			P		P	P			P		M.A. & INTENSITY PRED., ALG. IS PROBABLY CORALLINE.
17	1	P	P	P	P	P	P	P	P	P	P		STUDY DATES: 1949 TO 1960. DREDGE & NET COLLECTION, ECHIUS. (P), SEA-URCHINS (P), E & F-BRYS., MOLS. INCL. GASTS. & PELS., SOL. & COL. TUNS., ISOPODS (P)., COL. HYDROIDS.
17	A				P	P	P	P	P	P			INTENSITY & M.A. PRED., MOLS. INCL. MUSS.: MYTILUS & MODIOLUS.

ADDITIONAL INFORMATION

1 - JAN	7 - JUL
2 - FEB	8 - AUG
3 - MAR	9 - SEP
4 - APR	10 - OCT
5 - MAY	11 - NOV
6 - JUN	12 - DEC



INDICES

I. INDEX OF CHART COORDINATES

Map No.	Latitude	Latitude	Longitude	Longitude
1	59°N	69°N	27°W	10°W
2	58°30'N	70°N	56°W	33°W
3	51°N	68°N	58°W	98°W
4	42°30'N	55°N	50°W	75°W
5	31°N	42°30'N	64°W	82°30'W
6	15°N	31°N	76°30'W	98°30'W
7	5°N	26°30'N	58°W	76°30'W
8	7°N	34°S	23°30'W	60°W
9	34°S	57°30'N	52°W	79°W
10	15°S	34°S	65°W	85°W
11	5°N	15°S	70°W	94°W
12	5°N	15°N	76°30'W	93°30'W
13	15°N	31°N	98°30'W	120°W
14	31°N	46°N	112°30'W	127°30'W
15	46°N	62°N	122°W	155°W
16	50°N	66°N	167°E	155°W
17	66°N	72°N	155°W	175°E

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CHART 2.

Greenland

CHART 3.

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- Labrador
- N. W. Terr.
- Ontario
- Quebec

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- New Brunswick
- Newfoundland
- Nova Scotia
- Quebec

United States of America
- Maine
- New Hampshire

CHART 5.

Bermuda
United States of America
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- Delaware
- Georgia
- Maryland
- New Jersey
- New York
- North Carolina
- Pennsylvania
- Rhode Island
- South Carolina
- Virginia

CHART 6.

Bahama Is.
British Honduras
Cuba
Guatemala
Honduras
Jamaica
Mexico
United States of America
- Alabama
- Florida
- Louisiana
- Texas

CHART 7.

Bahama Is.
Columbia
Cuba
Dominican Republic
Haiti
Jamaica
Lesser Antilles
Puerto Rico
Trinidad
Venezuela

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French Guiana
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CHART 14.

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United States of America
  California

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United States of America
  Alaska
  Oregon
  Washington

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United States of America
  Alaska

CHART 17.

Union of Soviet Socialist Republics
United States of America
  Alaska

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B. Iceland

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3. Kangamiut, Grl.
4. Amerdloq Fjord, Grl.
A. Greenland
B. Greenland
C. Greenland

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2. Ungava Bay (S.W.), Can.
3. Nuyuk Hbr., Can.
A. Hudson Bay Area, Can.
B. Foxe Basin Area, Can.
C. Hudson Str. (S.), Can.
D. Labrador, Can.
E. Baffin Is. (E. Coast), Can.

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3. Rockland, Me., U. S.
4. Casco Bay, Me., U. S.
5. Portland, Me., U. S.
6. Portsmouth, N. H., U. S.
7. Penobscot Bay, Me., U. S.
8. Lomond, Newf., Can.
9. Corner Brook, Newf., Can.
10. St. Mary's Bay, Newf., Can.
11. St. George's, Newf., Can.
12. Argentia, Newf., Can.
13. Belle Isle Str., Can.
14. Lamoine, Me., U. S.
15. Bar Harbor, Me., U. S.
A. Newfoundland, Can.
B. Labrador, Can.

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2. Red Bank, N. J., U. S.
3. Sandy Hook, N. J., U. S.
4. Cape May, N. J., U. S.
5. Barnegat City, N. J., U. S.
6. Bayonne, N. J., U. S.
7. Woods Hole, Mass., U. S.
8. New London, Conn., U. S.
9. Newport, R. I., U. S.
10. Block Is., R. I., U. S.
11. Chatham, Mass., U. S.
12. New Bedford, Mass., U. S.
13. Quonset Point, R. I., U. S.
14. Providence, R. I., U. S.
15. Fall River, Mass., U. S.
16. Atlantic Beach, N. Y., U. S.
17. Brooklyn, N. Y., U. S.
18. Boston, Mass., U. S.
19. Lynn, Mass., U. S.
20. Hingham, Mass., U. S.
21. Bayshore, Long Is., N. Y., U. S.
22. Staten Is., N. Y., U. S.
23. Hampton Roads, Va., U. S.
24. Yorktown, Va., U. S.
25. Chesapeake Bay, U. S.
26. Portsmouth, Va., U. S.
27. Norfolk, Va., U. S.
28. Cape Charles, Va., U. S.
29. Lewes, Del., U. S.
30. Solomons, Md., U. S.
31. Baltimore, Md., U. S.
32. Annapolis, Md., U. S.
33. Lee Hall, Va., U. S.
34. Bulls Bay, S. C., U. S.
35. Southport, N. C., U. S.
36. Charleston, S. C., U. S.
37. Wilmington, N. C., U. S.
38. Ocracoke, N. C., U. S.
39. Morehead City, N. C., U. S.
40. Piney Point, Md., U. S.
41. Fisher's Is., N. Y., U. S.
42. Tomkins Cove, N. Y., U. S.
43. U.S.N. Op. Base, Berm., U. K.
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45. Cockspur Is., Ga., U. S.

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47. Queentree Landing, Md., U. S.
48. Patuxent Bridge, Md., U. S.
49. Chalk Point, Md., U. S.
50. Eagle Hbr., Md., U. S.
51. Lower Marlboro, Md., U. S.

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1. Tampa, Fla., U. S.
2. St. Petersburg, Fla., U. S.
3. St. Andrews Bay, Fla., U. S.
4. Panama City, Fla., U. S.
5. Pensacola, Fla., U. S.
6. Mobile, Ala., U. S.
7. Key West, Fla., U. S.
8. Jacksonville, Fla., U. S.
9. Ft. Pierce, Fla., U. S.
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11. Biscayne Bay, Fla., U. S.
12. Sabine, Texas, U. S.
13. Port Isabel, Tex., U. S.
14. Gulfport, Miss., U. S.
15. Galveston, Tex., U. S.
16. Corpus Christi, Tex., U. S.
17. Tongue of the Ocean, Bah., U. K.
18. Andros Is., Bah., U. K.
19. Port Royal, Jam.
20. Mayport, Fla., U. S.
21. Ft. Lauderdale, Fla., U. S.
22. Barataria Pass, La., U. S.
23. Baffin Bay, Tex., U. S.
24. Laguna Madre (Upper), Tex., U. S.
25. Oyster Bay, Tex., U. S.
26. Freeport, Tex., U. S.
27. Caminada Pass, La., U. S.

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2. San Juan, P. R., U. S.
3. Mona Is., P. R., U. S.
4. Ponce, P. R., U. S.
5. Trinidad, Braz.
6. Guantanamo Bay, Cuba
7. Vieques, P. R., U. S.
8. St. Thomas, Virgin Is., U. S.
9. Barbados, U. K.

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2. Fernando De Noronha Is., Braz.
3. Rocas, Atol das, Braz.
4. Sao Pedro e Sao Paulo, Penedos de, Braz.
5. Ponta de Corumbau, Braz.
6. Paranagua, Braz.
7. Cabo de Sao Tome, Braz.
8. Baia de Todos Os Santos, Braz.
9. Salvador Bahia, Braz.

CHART 9.

1. Maldonado, Uru.
2. Ushuaia, Arg.
3. Puerto Madryn, Arg.
4. Puerto Belgrano, Arg.
5. Necochea, Arg.
6. Quequen, Arg.
7. Quinta Is., Arg.
8. Cabo San Antonio, Arg.

A. Chile
B. Chile
C. Tierra del Fuego, Arg.
D. Falkland Is., U. K. and Arg.
E. Argentina

CHART 10.

A. Peru and Chile
B. Chile
C. Juan Fernandez Is., Chile

CHART 11.

A. Galapagos Is., Ecua.
B. Ecuador
C. Peru

CHART 12.

1. Balboa, Pan.
2. Coco Solo, Pan.
3. Cristobal, Pan.
4. Ft. Amador, Pan.

CHART 13.

NO DATA

CHART 14.

1. San Francisco, Calif., U. S.
2. San Diego, Calif., U. S.
3. Port Hueneme, Calif., U. S.
4. Oakland, Calif., U. S.
5. Monterey, Calif., U. S.
6. Mare Is., Calif., U. S.
7. Benicia, Calif., U. S.
8. Alameda, Calif., U. S.
9. Samoa, Calif., U. S.
10. Long Beach, Calif., U. S.
11. San Pedro, Calif., U. S.
12. Point Arena, Calif., U. S.
13. Vallejo, Calif., U. S.
14. San Pablo Bay, Calif., U. S.
15. South Balboa, Calif., U. S.
16. Terminal Is., Calif., U. S.
17. Treasure Is., Calif., U. S.
18. Port Chicago, Calif., U. S.
19. La Jolla, Calif., U. S.
20. Los Angeles, Calif., U. S.
21. Alamitos Bay, Calif., U. S.
22. Big Rock area, Calif., U. S.
23. Santa Barbara area, Calif., U. S.
24. Gaviota area, Calif., U. S.
25. Santa Monica Bay, Calif., U. S.
26. Point Conception area, Calif., U. S.

CHART 15.

1. Astoria, Ore., U. S.
2. Everett, Wash., U. S.
3. Seattle, Wash., U. S.
4. Tacoma, Wash., U. S.
5. Kodiak, Alas., U. S.
6. Sitka, Alas., U. S.
7. Haines, Alas., U. S.
8. Indian Is., Wash., U. S.
9. Bremerton, Wash., U. S.
10. Mt. Edgecumbe, Alas., U. S.
11. Trinity Is. (E.), G. of Alas.
12. G. of Alas. area
13. G. of Alas. area
14. Friday Hbr., Wash., U. S.

CHART 16.

1. Attu, Alas., U. S.
2. Cold Bay, Alas., U. S.
3. Dutch Hbr., Alas., U. S.
4. Adak Is., Alas., U. S.
5. St. Paul Hbr., Alas., U. S.
6. G. of Alas. area
7. Unimak Is. area, Alas., U. S.
8. Alas. Pen. area
9. Alas. Pen. area
10. Alas. Pen. area
11. Alas. Pen. area
12. Alas. Pen. area
13. Alas. Pen. area
14. Alas. Pen. area
15. Alas. Pen. area
16. Alas. Pen. area
17. Alas. Pen. area
18. Alas. Pen. area
19. Alas. Pen. area
20. Alas. Pen. area
21. Unimak Is. area, Alas., U. S.

A. U.S.S.R., Bering Sea Coast
B. Alaska, Bering Sea Coast

CHART 17.

1. Point Barrow, Alas., U. S.

A. Chukchi Sea area

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SELECTED REFERENCES

Aleem, A. A., 1957, Succession of marine fouling organisms on test panels immersed in deep water at La Jolla, California: Hydrobiologia, v. 2, no. 1, p. 40-58.

American Society of Mechanical Engineers, 1950, Symposium on marine fouling-Discussion: Trans. Amer. Soc. Mech. Eng., v. 72, p. 133-144.

Andrews, J. D., 1955, Fouling organisms of Chesapeake Bay: Chesapeake Bay Inst. Inshore Surv. Prog., Interim Rept. no. 17, 16p.

Anon, 1952, Long Beach Harbor Pollution Survey: Los Angeles Regional Water Pollution Control Board No. 4, Los Angeles, Calif., 43p.

Anon, 1952, Marine fouling and its prevention: U. S. Naval Inst., Annapolis, Md., 388p.

Ayers, J. C., 1951, The Average weight of fouling of surface objects in the waters adjacent to New York Harbor: Hydrography of New York Harbor, Cornell Univ., Status Rept. no. 6 (Unpub.), var. pgs.

Balech, E., 1954, Breves datos sobre la distribucion geografica y estacional del plancton marino de la Argentina. (Brief data on the geographic and seasonal distribution of marine plankton of Argentina): Revista de Biologia Marina, v. 4, no. 3, pt. 7, p. 211-224.

Bandy, D. L., 1958, Dominant molluscan faunas of the San Pedro Basin, California: Jour. Paleo., v. 32, no. 4, p. 703-714.

Barnard, J. L., 1963, Relationship of benthic Amphipoda to invertebrate communities of inshore sublittoral sands of southern California: Pacific Naturalist, v. 3, no. 15, p. 439-467.

_____, 1958, Amphipod crustaceons as fouling organisms in Los Angeles-Long Beach harbors, with reference to the influence of sea-water turbidity: Calif. Fish and Game, v. 44, p. 161-170.

_____, Hartman, O., and Jones, G. F., 1959, Benthic biology of the mainland shelf of southern California: State Water Pollution Control Board, California, Pub. no. 20, p. 265-429.

Barns, R. D., 1963, Invertebrate zoology: Philadelphia, Pa., W. B. Saunders, Co., 632p.

Beckner, C. F., Jr., 1966, Marine fouling and corrosion of instrumentation at Argus Island: U. S. Naval Ocean. Off., Inf. Manus. Rept. no. 0-55-65, 9p.

Preceding page blank

Beebe, C. W., 1947, Book of bays: New York, Harcourt, Brace and Co., 302p.

Belyayev, G. M., 1960, Kolichestiennoye raspredelenye donnoy fuany v severozapadnoy chasti Beringova Morya, (Quantitative distribution of bottom fauna in the northwestern Bering Sea): Trudy Inst. Okean. Akad. nauk SSSR, v. 34, p. 85-103.

Bertelsen, E., 1937, Contributions to the animal ecology of the fjords of Angmagssalik and Kangerdlugssuaq in east Greenland: Kobenhavn, C. A. Reitzel.

Bethlehem Steel Co., Marine borers and fouling organisms and their prevalence in the vicinity of Bethlehem Shipyard properties:
1945-1st Ann. Rept. (1944), Res. Rept. no. 22, Shipbldg. Div., Cent. Tech. Dept., Quincy, Mass., 110p.
1946-2nd Ann. Rept. (1945), Res. Rept. no. 39, Shipbldg. Div., Cent. Tech. Dept., Quincy, Mass., 89p.
1947-3rd Ann. Rept. (1946), Res. Rept. no. 53, Shipbldg. Div., Cent. Tech. Dept., Quincy, Mass., 88p.
1948-4th Ann. Rept. (1947), Res. Rept. no. 60, Shipbldg. Div., Cent. Tech. Dept., Quincy, Mass., 76p.
1949-5th Ann. Rept. (1948), Res. Rept. no. 64, Shipbldg. Div., Cent. Tech. Dept., Quincy, Mass., 78p.

_____, Marine borers and fouling organisms and their prevalence in the vicinity of Bethlehem Pacific Coast Steel Shipyard properties:
1950-6th Ann. Rept. (1949), Res. Rept. no. 69, Shipbldg. Div., Cent. Tech. Dept., Quincy, Mass., 79p.
1951-7th Ann. Rept. (1950), Res. Rept. no. 72, Shipbldg. Div., Cent. Tech. Dept., Quincy, Mass., 79p.
1952-8th Ann. Rept. (1951), Res. Rept. no. 74, Shipbldg. Div., Cent. Tech. Dept., Quincy, Mass., 54p.
1953-9th Ann. Rept. (1952), Res. Rept. no. 75, Shipbldg. Div., Cent. Tech. Rept., Quincy, Mass., 61p.
1954-10th Ann. Rept. (1953), Res. Rept. no. 79, Shipbldg. Div., Cent. Tech. Dept., Quincy, Mass., 62p.
1955-11th Ann. Rept. (1954), Res. Rept. no. 80, Shipbldg. Div., Cent. Tech. Dept., Quincy, Mass., 59p.

Bishop, M. W. H., Pyefinch, K. A., and Spooner, M. F., 1948, The interpretation of fouling samples from ships: Iron and Steel Jour., v. 161, p. 35-40.

Boone, L., 1928, Molluska from the Gulf of California and the Perlas Islands: Bingham Ocean. Coll. Bull., v. 2.

Boucher, T. W., 1950, Flora and vegetation of Greenland: Ency. Arctica, v. 6, no. 3, 37p.

Bousfield, E. L., 1954, The distribution and spawning seasons of barnacles on the Atlantic coast of Canada: Nat. Mus. Can. Bull., no. 32, p. 112-154.

Boyson, V. F., 1942, The Falkland Islands: Oxford, England, Clarendon Press, 414p.

Breuer, J. P., 1957, Ecological survey of Baffin and Alazan Bays, Texas: Inst. Mar. Sci. Pubs., v. 4, no. 2, p. 134-155.

Carcelles, A. R., 1933, Breves observaciones biologicas efectuadas en Bahia San Blas a bordo del sloop San Luis, Febrero-Abril de 1932, (Brief biological observations taken in San Blas Bay on board the sloop San Luis, February-April 1932): Boletin del Centro Naval, tomo 51, num. 498, p. 585-603.

_____,1935, Sobre algunos invertebrados marinos de la Isla de los Estados, (On some marine invertebrates of Staten Island): Boletin del Centro Naval, tomo 53, num. 511, p. 849-864.

_____,and Pozzi, A., 1933, A pontes sobre la fauna del Golfo San Matias, (Notes on the fauna of the Gulf of San Matias): Boletin del Centro Naval, tomo 52, num. 503, p. 693-708.

_____,and Williamson, S. I., 1951, Catalogo de los moluscos marinos de la Provincia Magallanica, (Catalog of the marine molluscs of the Magellan Province): Revista del Instituto Nacional de Investigacion de las Ciencial Naturales, Bernadino Rivadavia, Ciencias Zoologicas, tomo 2, num. 5, p. 225-383.

Chapman, V. J., 1950, Seaweeds and their uses: London, Methuen, 278p.

Clapp, W. F., 1950, Some biological fundamentals of marine fouling: Trans. Amer. Soc. Mech. Eng., v. 72, no. 2, p. 101-107.

Clapp Labs. Inc. (Battelle Mem. Inst.), 1967, Marine borer and fouling studies: Final Rept. 1 Apr.-14 Jun. 1967, U. S. Navy Dept., Off. Nav. Res. Rept. no. 13759, 38p.

_____,no date, Data sheets for Argentia, Corner Brook and Lomond, Newfoundland; Grandal, Greenland, and weather station Baker: On file at the U. S. Naval Ocean. Off., Wash., D. C., Unpub.

Coe, W. R., 1932, Season of attachment and rate of growth of sedentary marine organisms at a pier of Scripps Institute for Oceanography, La Jolla, California: Bull. Scripps Inst. Ocean. Tech. Ser. 3, no. 3, p. 37-86.

_____, and Allen, W., 1937, Growth of sedentary marine organisms on experimental blocks and plates for nine successive years at the pier of the Scripps Institute of Oceanography: Bull. Scripps Inst. Ocean. Bull, v. 4, p. 101-136.

Coker, R. E., 1910, The fisheries and guano industry of Peru: Bull. Bur. Fisheries, v. 28, pt. 1, p. 333-365.

Collins, F. S., 1927, Marine algae from Bering Strait and Arctic Ocean, etc.: Botony, v. 4, pt. B, p. 3-16.

Cory, R. L., 1964, Environmental factors affecting attached macro organisms, Patuxent River estuary, Maryland: U. S. G. S. Prof. Paper 475-D, p. 194-197.

_____, 1967, Epifauna of the Patuxent River estuary, Maryland, for 1963 and 1964: Chesapeake Sci., v. 8, no. 2, p. 71-89.

Cowan, I. M., no date, New information of the distribution of marine mollusca on the coast of British Columbia: Veliger, v. 7, no. 2, p. 110-113.

Dall, W. H., 1910, Report on a collection of shells from Peru, with a summary of the littoral marine mollusca of the Peruvian zoological province: Proc. U. S. Nat. Mus., v. 37, no. 1704, p. 147-294.

Daugherty, M., Jr., 1961, Marine biological fouling in the approaches to Chesapeake Bay: U. S. N. Hydrogr. Off., Wash., D. C., H. O. TR-96, 40p.

Dawson, E. Y., 1944, The marine algae of the Gulf of California: Univ. S. Calif. Pubs., Allan Hancock Pac. Exp., v. 3, p. 189-454.

_____, 1945, An annotated list of the marine algae and marine grasses of San Diego County, California: San Diego Soc. Nat. Hist., Occ. Papers, no. 7, p. 1-87.

_____, 1949, Contributions toward a marine flora of the southern California Channel Islands: Allan Hancock Found., Occ. Paper no. 8, Los Angeles: Univ. S. Calif. Press.

Dehnel, P. A., 1956, Growth rates in latitudinally and vertically separated populations of Mytilus californianus: Bull. Biol., v. 110, no. 1, p. 43-53.

De Laubenfels, M. W., 1947, Ecology of the sponges of a brackish water environment at Beaufort, North Carolina: Ecol. Mono., v. 17, no. 1, p. 31-46.

_____, 1953, Sponges of the Alaskan Arctic: Smithsonian Misc. Coll., v. 121, no. 6, p. 1-21.

De Palma, J. R., 1962, Marine fouling and boring organisms in the tongue of the ocean-exposure II: U. S. Naval Ocean. Off., Wash., D. C., Inf. Manus. Rept. no. 0-70-62.

_____, 1962, Field results of the first year of a bottom fouling study in Penobscot Bay, Maine: U. S. Naval Ocean. Off., Wash., D. C., Inf. Manus. Rept. no. 0-34-62.

_____, 1963, Marine fouling and boring organisms off Ft. Lauderdale, Florida: U. S. Naval Ocean. Off., Wash., D. C., Inf. Manus. Rept. no. 0-70-62, 28p.

_____, 1966, A study of marine fouling and boring organisms at Admiralty Inlet, Washington: U. S. Naval Ocean. Off., Wash., D. C., Inf. Manus. Rept. no. 0-6-66, 23p.

Dexter, R. W., 1947, The marine communities of a tidal inlet at Cape Ann, Mass.: Ecol. Mono., v. 17, p. 261-294.

Eddy, S., 1925, The distribution of marine protozoa in the Friday Harbor waters (San Juan Channel, Washington Sound): Trans. Amer. Microscopical Soc., v. 44, no. 2, p. 97-108.

Eyerdam, W. J., 1960, Mollusks and brachiopods from Afognak and Sitkalidak Islands, Kodiak Group, Alaska: Nauticlus, v. 74, no. 2, p. 41-46.

Ferguson, F. F., and Jones, E. R., Jr., 1949, A survey of the shoreline fauna of the Norfolk peninsula: Amer. Midland Nat., v. 41, no. 2, p. 436-446.

Fitzgerald, J. W., Davis, M. S., and Hurdle, B. G., 1947, Corrosion and fouling of sonar equipment-Part I: U. S. Naval Res. Lab., Wash., D. C., Nav. Res. Lab. Rept. no. S 2477.

Forgeson, B. W., Southwell, C. R., and Alexander, A. L., 1958, Corrosion of metals in tropical environments. Part 3-Underwater corrosion of ten structural steels: U. S. Naval Res. Lab., Wash., D. C., Nav. Res. Lab. Rept. no. 5153, 24p.

Fowler, A. W., 1941, Underwater paint research-comparative fouling test between Point Reyes and Yerba Buena, California: U. S. N. Dept., Calif. Paint Lab., Mare Is., Calif.

Fraser, C. Mc., 1944, Hydroids of the Atlantic Coast of North America: Toronto, Can., Univ. of Toronto Press, 451p.

Fuller, J. L., 1946, Season of attachment and growth of sedentary marine organisms at Lamoine, Maine: Ecology, v. 27, no. 2, p. 150-158.

Galtsoff, P. S., 1954, Gulf of Mexico-its origin, waters, and marine life: Fish. Bull. of Fish and Wildlife Serv., v. 55, 604p.

Gaul, R. D., 1963, Natural fouling on instruments, in Gaul, R. D., ed., Status of environmental research off Panama City, Florida: O. N. R. Cont. no. 2119-4, Proj. NR-083-036, Texas A & M Proj. no. 286-D, Ref. 63-2T, College Station, Texas, p. 52-53.

_____, and Vick, N. G., 1964, Sessile organisms accumulation in a nearshore water column during a one year period: Texas A & M Dept. Ocean. & Meteor., Proj. 286-D, Ref. 64-10T.

Goodbody, I., 1961, Inhibition of the development of a marine sessile community: Nature, v. 190, p. 282-283.

Graham, H. W., and Gay, H., 1945, Season of attachment and growth of sedentary marine organisms at Oakland, California: Ecology, v. 26, no. 4, p. 375-386.

Grave, B. H., 1933, Rate of growth, age at sexual maturity, and duration of life of certain sessile organisms, at Woods Hole, Massachusetts: Bull. Biol., v. 65, no. 3, p. 375-386.

Gunter, G., 1950, Seasonal population changes and distribution as related to salinity of certain invertebrates of the Texas coast, including commercial shrimp: Inst. Mar. Sci. Pubs., v. 1, no. 2, p. 7-51.

_____, and Geyer, R., 1955, Studies on fouling organisms of the northwest Gulf of Mexico: Inst. Mar. Sci. Pubs., v. 4, no. 1, p. 37-67.

Haderlie, E. C., 1968, Marine fouling organisms in Monterey Harbor: Veliger, v. 10, no. 4, p. 327-341.

Henry, D. P., 1942, Studies on the sessile cirripedia of the Pacific coast of North America: Univ. Wash. Pubs. Ocean., v. 4, no. 3, p. 95-134.

Hentschel, E., 1933, Allgemeine biologie des Sudatlantisch ozeans, (General biology of the South Atlantic ocean): Deutsche Atlantische Expedition Auf dem Forschungs-and Vermessungs-schiff "Meteor", 1925-1927, Wissenschaftliche Ergebnisse, band 11, lief. 1-2.

Hewatt, W. G., 1937, Ecological studies on selected marine intertidal communities of Monterey Bay, California: Amer. Midland Nat., v. 18, p. 161-206.

Hutchins, L. W., 1949, Fouling in the western Pacific: Woods Hole Ocean. Inst., Tech. Rept. 6, Off. Nav. Res. Cont. N6ori-195, NR-083-003.

_____, and Dewey, E. S., Jr., 1944, Estimation and prediction of the weight and thickness of mussel fouling on buoys: Woods Hole Ocean. Inst. Interim Rept. no. 1 for 1941 to U. S. N. BUSHIPS, Unpub. Manus.

Johnson, M. W., and Miller, R. C., 1935, The seasonal settlement of shipworms, barnacles, and other warf-pile organisms at Friday Harbor, Washington: Wash. State Univ. Pub. Ocean., v. 2, no. 1, p. 1-18.

Jolly, A. B., 1951, Contribuicao para o conhecimento da flora algologica marinha do estado do Parana, (Contribution to knowledge of marine algal flora of the state of Parana): Instituto Paulista de Oceanografia, Sao Paulo, Boletim, tomo 2, fasc. 1, p. 125-136.

Jones, G. F., 1964, The distribution and abundance of subtidal benthic mollusca on the mainland shelf on southern California: Malacologia, v. 2, no. 1, p. 43-68.

Ladd, H. S., 1951, Brackish water and marine assemblages of the Texas coast, with special reference to mollusks: Inst. Mar. Sci. Pub., v. 2, no. 1, p. 129-163.

Lubinsky, I., 1958, Studies on Mytilus edulis L. of the Calanus expedition to Hudson Bay and Ungava Bay: Can. Jour. Zool, Calanus Exp. no. 16, v. 36, no. 6, p. 869-881.

Lunz, G. R., Jr., 1940, Periodicity of fouling growths at Cavite, Philippine Islands and Guantanamo Bay, Cuba: Unpub. Rept. to Bur. Construction and Repair, USN BUSHIPS Ref. S19-1-(3), 2.

MacGinitie, G. E., 1955, Distribution and ecology of the marine invertebrates of Point Barrow, Alaska: Smithsonian Misc. Coll., v. 128, no. 9, p. 1-183.

Madsen, F. J., 1949, Marine bivalvia, in The zoology of Iceland, v. 4, p. 1-116: Copenhagen and Reykjavik, Ejnar Munksgaard.

Madsen, H., 1936, Investigations on the shore fauna of east Greenland with a survey of the shores of other Arctic regions: Kobenhavn, C. A. Reitzel.

_____, 1940, A study of the littoral fauna of northwest Greenland: Kobenhavn, C. A. Reitzel.

Maloney, W. E., 1958, A study of the types, seasons of attachment, and growth of fouling organisms in the approaches to Norfolk, Virginia: U. S. Naval Ocean. Off., Wash., D. C., T. R. no. 47, 35p.

McDougall, K. D., 1943, Sessile marine invertebrates at Beaufort, North Carolina: Ecol. Mono., v. 13, no. 3, p. 321-374.

McLaughlin, P. A., 1963, Survey of the benthic invertebrate fauna of the eastern Bering Sea: U. S. Fish and Wildlife Serv. Spec. Sci. Rept.-Fisheries no. 401, Wash., D. C., 75p.

Miller, T. L., 1966, Marine fouling organisms in Monterey Harbor, California: Unpub. M. S. Thesis, U. S. N. Postgrad. School, Monterey, Calif.

Miner, R. W., 1950, Field book of seashore life: New York, G. P. Putnam's Sons, 888p.

Mohr, J. L., 1952, The relationship of the areas of marine borer attack to pollution patterns in Los Angeles-Long Beach Harbors: Rept. of the Mar. Borer Conf. ML 4719: I-1 through I-5., Univ. Miami Mar. Lab., Miami, Fla.

Mommsen, D. B., 1966, A study of marine fouling in Monterey Harbor, California: Unpub. M. S. Thesis, U. S. Naval Postgrad. School, Monterey, Calif.

Monod, T., 1950, Sur les deux bords de L'Atlantique Sud, (Concerning the two coasts of the South Atlantic): Instituto Paulista de Oceanografia, Sao Paulo, Boletim, tomo 1, fasc. 2, p. 29-38.

Moritz, C. E., 1944, Mine warfare and marine fouling: U. S. Naval Ord. Lab., Rept. no. 957, Wash., D. C., 36p.

Muenscher, W. L. C., 1915, A study of the algal associations of San Juan Island: Wash. State Univ., Puget Sound Mar. Sta. Pubs., v. 1, p. 59-84.

Murphy. R. C., The seacoast and islands of Peru: Brooklyn Mus. Quarterly, pts. 1-11,
1920, v. 7, (no. 2, p. 69-95), (no. 3, p. 165-187), (no. 4, p. 239-272).
1921, v. 8, (no. 1, p. 1-28), (no. 2, p. 35-55), (no. 3, p. 91-105), (no. 4, p. 142-155).
1922, v. 9, (no. 1, p. 44-70), (no. 2, p. 95-107), (no. 3, p. 141-154), (no. 4, p. 165-183).

Nash, C. B., 1947, Environmental characteristics of a river estuary: Maryland Dept. Res. and Ed., v. 64, p. 147-174.

Olds, M. C., 1941, Taxonomy and distribution of the boring sponges (clionidae) along the Atlantic coast of North America: Chesapeake Biol. Lab. Pub. no. 44.

Osburn, R. C., 1944, A survey of the bryozoa of Chesapeake Bay: Chesapeake Biol. Lab. Pub. no. 63.

Pequegnat, W. E., 1965, A study of biofouling on protected and unprotected artificial substrates: Texas A&M Dept. Ocean. and Meteor., Prog. Rept. no. 65-17T.

Phelps, A., 1941, Observations on fouling on test panels at Port Aransas, Texas: U. S. N. BUSHIPS, Unpub. Rept., Ref. no. S19-1-(3).

Pilsbury, H. A., 1910, Report on barnacles of Peru, collected by Dr. R. C. Coker and others: Proc. U. S. Nat. Mus., v. 37, no. 1700, p. 63-74.

_____, and Lowe, H. N., 1932, West Mexican and central American mollusks collected by H. A. Lowe, 1929-1931: Acad. Nat. Sci. Proc., v. 84, p. 33.

Polunin, N., 1950, Canadian eastern Arctic: Ency. Arctica, v. 6, nos. 1a and 1b, 137p.

Pomerat, C. M., and Weiss, C. M., 1946, The influence of texture and composition of sedentary marine organisms: Bull. Biol., v. 91, p. 57-65.

Proctor, W., 1933, Biological survey of the Mount Desert region: Pt. 5, from the laboratory of the Biological Survey of the Mt. Desert Region, Corfield, Bar Harbor, Maine. The Wistar Inst. Anat. and Bio., Philadelphia, Pa.

Reish, D. J., no date, Discussion of the Mytilus californianus community on newly constructed rock jetties in southern California: Veliger, v. 7, no. 2, p. 95-101.

_____,1959, An ecological study of pollution in Los Angeles-Long Beach Harbors, California: Allan Hancock Found. Pubs., Occ. Paper no. 22, Univ. S. Calif., 119p.

_____,1961, The relationship of temperature and dissolved oxygen to the seasonal settlement of the polychaetous annelid Hydroides norvegica (Gunnerus): Bull. S. Calif. Acad. Sci., v. 60, pt. 1, p. 1-11.

_____,1961, A study of benthic fauna in a recently constructed boat harbor in southern California: Ecology, v. 42, no. 1, p. 84-91.

Rice, L., 1929-1930, Pecularities in the distribution of barnacles in communities and their probable causes: Wash. State Univ., Puget Sound Biol. Sta. Pubs., v. 7, p. 249-257.

Richards, B. R., and Clapp, W. F., 1944, A preliminary report on the fouling characteristics of Ponce de Leon Inlet, Daytona Beach, Florida: Sears Found. Jour. Mar. Res., v. 5, p. 189-195.

Ricketts, E. F., and Calvin, J., 1948, Between Pacific tides: Revised by Hedgpeth, J., 1962, 3rd ed., Stanford Univ. Press, Stanford, Calif., 516p.

Rucker, J. B., 1964, Intertidal fouling community at Penobscot Bay, Maine: U. S. Naval Ocean. Off., Wash., D. C., Inf. Manus. Rept. no. 0-2-64, 20p.

Scheer, B. T., 1945, The development of marine fouling communities: Bull. Biol., v. 89, p. 103-121.

Setchell, W. A., 1937a, Report on the seagrasses: Proc. Calif. Acad. Sci., ser. 4, v. 22, p. 127-158.

_____,and Gardner, N. L., 1903, Algae of northwestern America: Calif. Univ. Pubs. in Bot., v. 1, p. 165-418.

Shelford, V. W., 1929-1930, Geographical extend and succession in Pacific North America intertidal (Balanus) communities: Wash. Sta. Univ., Puget Sound Biol. Sta. Pubs., v. 7, p. 217-223.

_____, and Towler, E. D., 1925, Animal communities of the San Juan Channel and adjacent areas: Puget Sound Biol. Sta. Pubs., v. 5, p. 33-73.

_____, Weese, A. O., Rice, L. A., Rassmussen, D. I., and MacLean, A., 1935, Some marine biotic communities of the Pacific coast of North America: Ecol. Mono., v. 5, p. 249-332.

Shetsov. V. V., 1964, The quantitative distribution of benthic fauna in the Gulf of Alaska: Soviet Fisheries Investigations in the Northeast Pacific, Part II, p. 109-114, Trans. from Russian.

Shoemaker, C. R., 1955, Amphipoda collected at the Arctic laboratory, Office of Naval Research, Point Barrow, Alaska, by G. E. MacGinitie: Smithsonian Misc. Coll., v. 128, p. 1-78.

Simmons, E. G., 1957, An ecological survey of the upper Laguna Madre of Texas: Inst. Mar. Sci. Pubs., Univ. Texas, v. 4, no. 2, p. 156-200.

Smith, F. G. W., Williams, R. H., and Davis, C. C., 1950, An ecological survey of the subtropical inshore waters adjacent to Miami: Ecology, v. 31, no. 1, p. 119-146.

Soot-Ryen, T., 1955, A report on the family Mytilidae (Pelecypoda): Allan Hancock Pac. Exp., v. 20, no. 1, p. 1-174.

Steven, D., 1938, The shore fauna of Amerdloq fjord, west Greenland: Jour. Animal Ecol., v. 7, no. 1, p. 53-70.

Taylor, W. R., 1930-1931, A synopsis of the marine algae of Brazil: Revue Algologique, tome 5, p. 279-313.

_____, 1957, Marine algae of the northeastern coast of North America: Ann Arbor, Mich., Univ. Mich. Press, 2nd Rev. ed., 509p.

_____, 1960, Marine algae of the eastern tropical and subtropical coasts of the Americas: Univ. Mich. Studies Sci. Ser., Univ. Mich. Press, v. 21, 870p.

Treadwell, A., 1937, Polychaetous annelids from the west coast of lower California, the Gulf of California and Clarion Island: New York Zool. Soc. Cont., v. 22, p. 139-160.

Tseng, P. D., 1939, Seaweed resources of North America and their utilization: Econ. Bot., v. 1, p. 69-97.

U. S. Bureau of Yards and Docks, Civil Engineer Corps, 1951, Report on marine borers and fouling organisms in 56 important harbors and tabular summaries of marine borer data from 160 widespread locations: Bur. Yards & Docks, Wash., D. C., NAVDOCKS TP-RE-1, 327p.

_____,Dept. of the Navy, 1965, Marine biology operational handbook-inspection, repair and preservation of waterfront structures: Bur. Yards & Docks, Wash., D. C., NAVDOCKS MO-311, 114p.

U. S. Naval Oceanographic Office, 1965, Nearshore environmental analog prediction system status report: Mar. Sci. Dept., Eval. Branch, Inf. Manus. Rept. no. 0-15-65, 73p.

_____,Biological fouling data bank: Mar. Sci. Dept., Ocean. Analysis Div.

U. S. Naval Ordnance Laboratory, 1944, Mine warfare and marine fouling: Nav. Ord. Lab. Rept. 957, p. 1-36.

Van Name, W. G., The North and South American ascidians: Bull. Amer. Mus. Nat. Hist., v. 84, 476p.

Vannucci, M., 1950, Resultados cientificos do cruzeiro do Baependi e do Vega a Ilha da Trinidade: Hydrozoa, (Scientific results of the cruises of the "Baependi" and the "Vega" to the island of Trinidad): Hydrozoa: Instituto Paulista de Oceanografia, Sao Paulo, Boletim, tomo 1, fasc. 1, p. 81-96.

_____,1951, Hydrozoa e scyphozoa existentes no Instituto Paulista de Oceanografia, (Hydrozoa and Scyphozoa existing in the Paulista Institute of Oceanography): Instituto Paulista de Oceanografia, Sao Paulo, Boletim, tomo 2, fasc. 1, p. 79-104.

_____,1951, Distribuicao dos hydrozoa ate agora conhecidos nas coastas do Brasil, (Current knowledge of the distribution of hydrozoa along the coasts of Brazil): Instituto Paulista de Oceanografia, Sao Paulo, Boletim, tomo 2, fasc. 1, p. 105-135.

Visscher, J. P., 1927, Nature and extent of ships' bottoms: Bull. U. S. Bur. Fisheries, v. 43, pt. 2, p. 193-252.

Weiss, C. M., 1948, The seasonal occurrence of sedentary marine organisms in Biscayne Bay, Florida: Ecology, v. 29, no. 2, p. 153-172.

Wharton, G. W., 1942, Report of the biologist: Norfolk Navy Yard, June 1941 to Aug. 1942, Unpub.

Whedon, W. F., 1943, Seasonal incidence of fouling at San Diego: Biol. Lab., Nav. Fuel Depot, San Diego, Calif., Ann. Rept. for 1942-1943, Unpub.

Whitten, H. L., Rosene, H. F., and Hedgpeth, J. W., 1950, Invertebrate fauna of the Texas coast jetties: Inst. Mar. Sci. Pub., v. 1, no. 2, p. 53-87.

Williams, L. G., and Bloomquist, H. L., 1947, A collection of marine algae from Brazil: Bull. Torrey Bot. Club (New York), v. 74, p. 383-397.

Woods Hole Oceanographic Institution, 1952, Marine fouling and its prevention: U. S. N. Inst., Annapolis, Md., 388p.

Zinn, D. J., Wood, R. D., and Berkowitz, H., Fouling project-final report: Unpub. Rept. no. 57-6 from Narragansett Mar. Lab. to Off. Nav. Res., Wash., D. C.

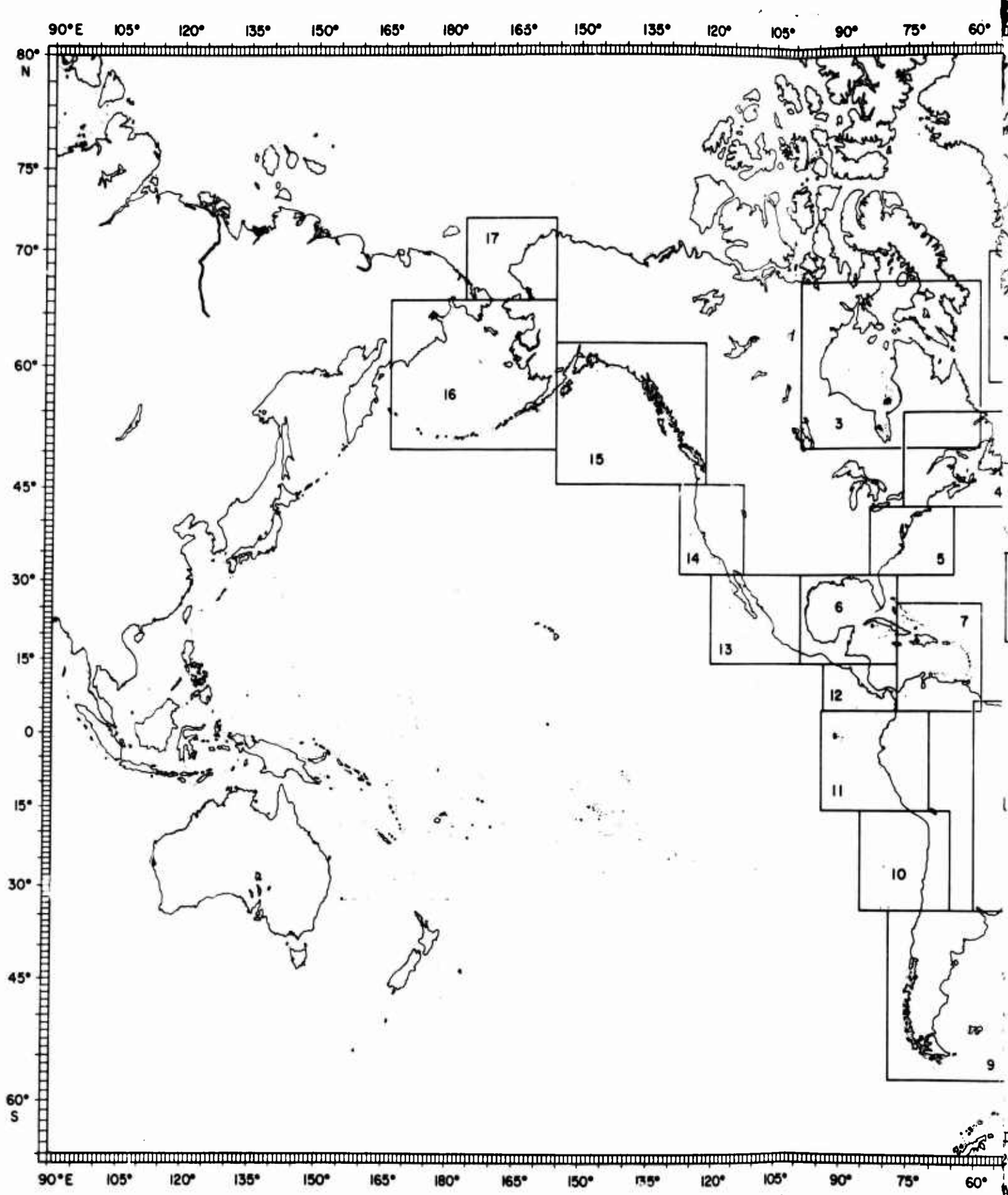

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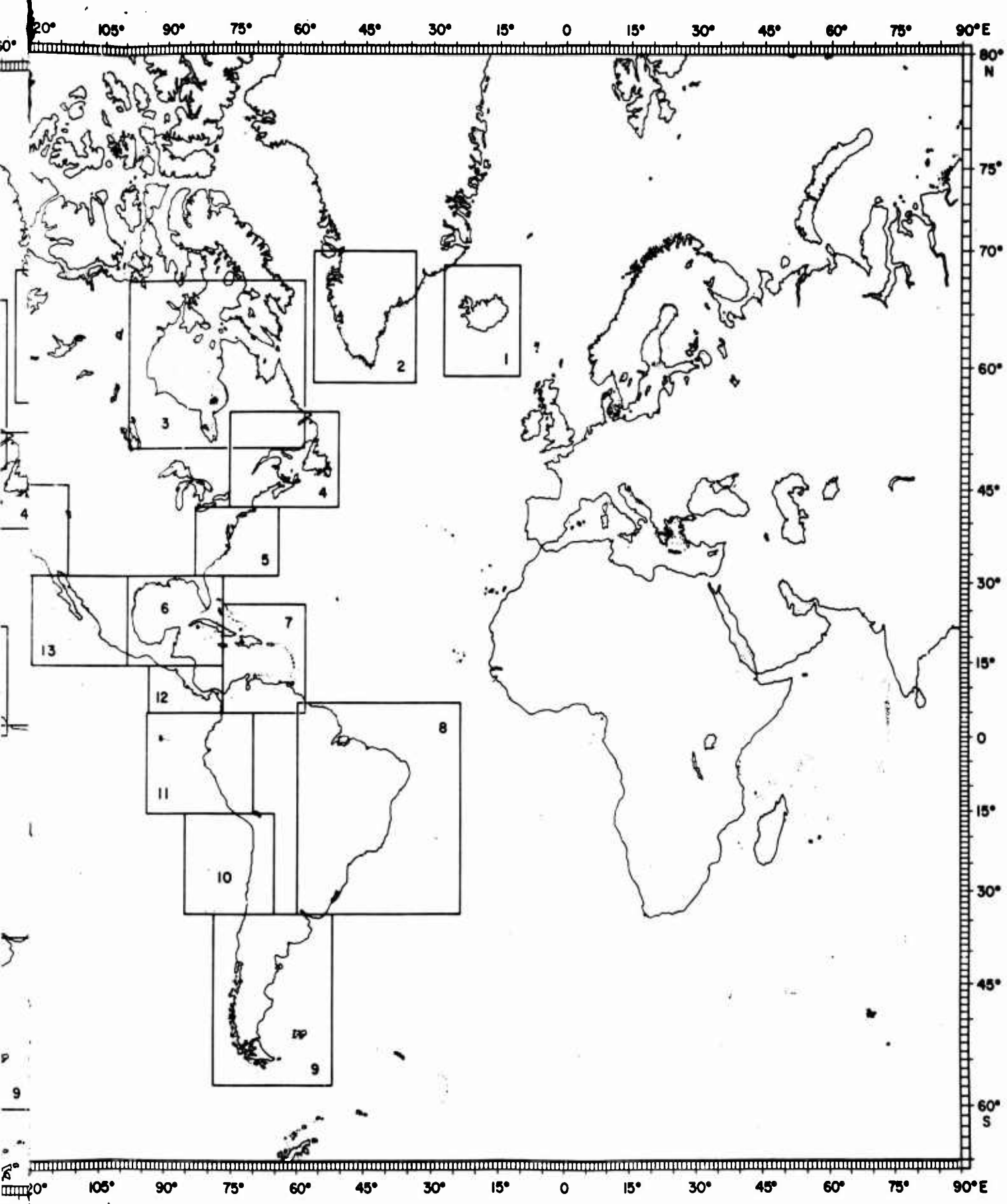
CHART 18 - WORLD REFERENCE CHART



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