

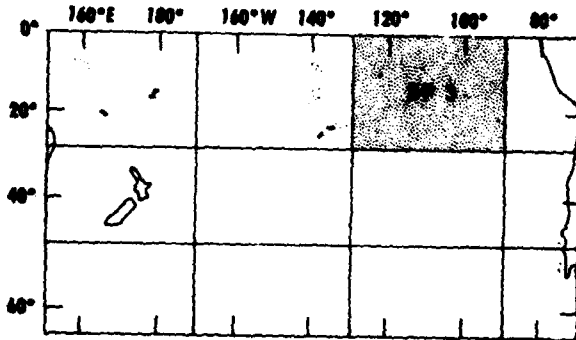
NAVAL OCEANOGRAPHIC OFFICE SPECIAL PUBLICATION 1403-SP 3

SURFACE CURRENTS

12 LEVEL II

NORTHEAST CENTRAL SOUTH PACIFIC OCEAN

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ABSTRACT

THIS ATLAS, AND THE SERIES OF WHICH IT IS A PART, IS COMPUTER GENERATED AND AUTOMATICALLY PLOTTED. IT MAKES AVAILABLE TO THE USER THE MOST RECENT SURFACE CURRENT DATA COLLECTED AND WILL BE UPDATED WHENEVER SUFFICIENT AMOUNTS OF DATA ARE ADDED TO THE DATA FILE. THIS AND THE OTHER ATLASES ARE BASED ON A VAST QUANTITY OF DATA AS COMPARED TO THE PREVIOUS MANUALLY-COMPILED EDITIONS PRINTED IN THE MID-THIRTIES.

THE SURFACE CURRENT INFORMATION IS BASED MAINLY ON SHIP DRIFT, WHICH IS THE DIFFERENCE BETWEEN THE DEAD RECKONING POSITION AND THE POSITION DETERMINED BY ANY TYPE OF NAVIGATIONAL FIX. THIS DIFFERENCE DESCRIBES THE DIRECTION AND SPEED OF THE CURRENT.

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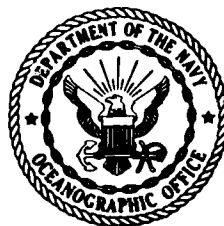
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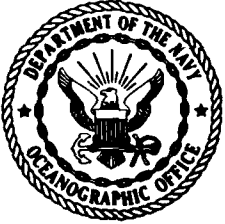
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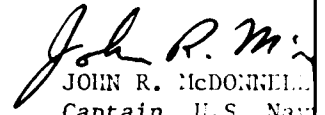
Messrs. Raymond J. Beauchesne* and William E. Boisvert made major contributions to this atlas.

*Mr. Beauchesne presently is employed by the Bureau of Naval Personnel.

FOREWORD

THIS ATLAS, ONE IN A SERIES OF 43 REGIONAL SURFACE CHARTS, IS PRODUCED TO FULFILL A NEED OF NAVY PLANNING STAFFS AND INDUSTRIAL COMMUNITIES FOR THE LATEST AVAILABLE OCEAN SURFACE DATA. THESE ATLASES ADD TO THE WEALTH OF NAUTICAL INFORMATION USEFUL FOR OPERATIONAL PLANNING, NAVIGATIONAL SAFETY, AND SHIPPING ECONOMY. THE PRODUCTION AND WIDE DISSEMINATION OF THIS ATLAS ARE MADE POSSIBLE BY THE LATEST COMPUTER TECHNIQUES.

THE CONSTANT IMPROVEMENT IN THE QUALITY OF SURFACE DATA RECEIVED OVER THE YEARS IS MADE POSSIBLE LARGELY BY THE MOISTURE OF VOLUNTARY OBSERVERS IN RECENT YEARS. THE DEFENSE MAPPING AGENCY, OCEANOGRAPHIC OFFICE, AND THE USER OF THE ATLASES RELY ON THE OBSERVATIONS OF THE MAN WHO HAS "BEEN THERE." MARINERS, IN MAKING OBSERVATIONS, RENDER A SERVICE NOT ONLY TO THEMSELVES BUT TO THE MEN WHO GO DOWN TO THE SEA IN SHIPS." WITH THE ADVENT OF NUCLEAR SUBMARINES, NAVIGATION AIDS, AND 300,000-TON SHIPS, UP-TO-DATE, RAPIDLY CHANGING ENVIRONMENTAL AND NAVIGATIONAL INFORMATION HAS BECOME INCREASINGLY IMPORTANT.


JOHN R. McDONNELL
Captain, U.S. Navy
Commander

FOREWORD

AS, ONE IN A SERIES OF 43 REGIONAL SURFACE CURRENT ATLASES, FILL A NEED OF NAVY PLANNING STAFFS AND THE SCIENTIFIC AND TIES FOR THE LATEST AVAILABLE OCEAN SURFACE CURRENT DATA. TO THE WEALTH OF NAUTICAL INFORMATION UPON WHICH OPERATIONAL SAFETY, AND SHIPPING ECONOMY DEPEND. RAPID DISSEMINATION OF THIS ATLAS ARE MADE POSSIBLE BY THE TECHNIQUES.

TANT IMPROVEMENT IN THE QUALITY OF SURFACE CURRENT DATA YEARS IS MADE POSSIBLE LARGELY BY THE MORE THOROUGH REPORTS OVER IN RECENT YEARS. THE DEFENSE MAPPING AGENCY, THE OFFICE, AND THE USER OF THE ATLASES RELY ON THE PERSONAL OBSERVATION OF THE MAN WHO HAS "BEEN THERE." MARINERS, IN REPORTING THEIR OBSERVATIONS, RENDER A SERVICE NOT ONLY TO THEMSELVES BUT ALSO TO ALL "WHO ARE IN SHIPS." WITH THE ADVENT OF NUCLEAR POWER, ELECTRONICALLY TRANSMITTED AND 300,000-TON SHIPS, UP-TO-DATE, RAPIDLY DISSEMINATED NAVIGATIONAL INFORMATION HAS BECOME INCREASINGLY IMPORTANT.

John R. McDonnell
JOHN R. McDONNELL
Captain, U.S. Navy
Commander

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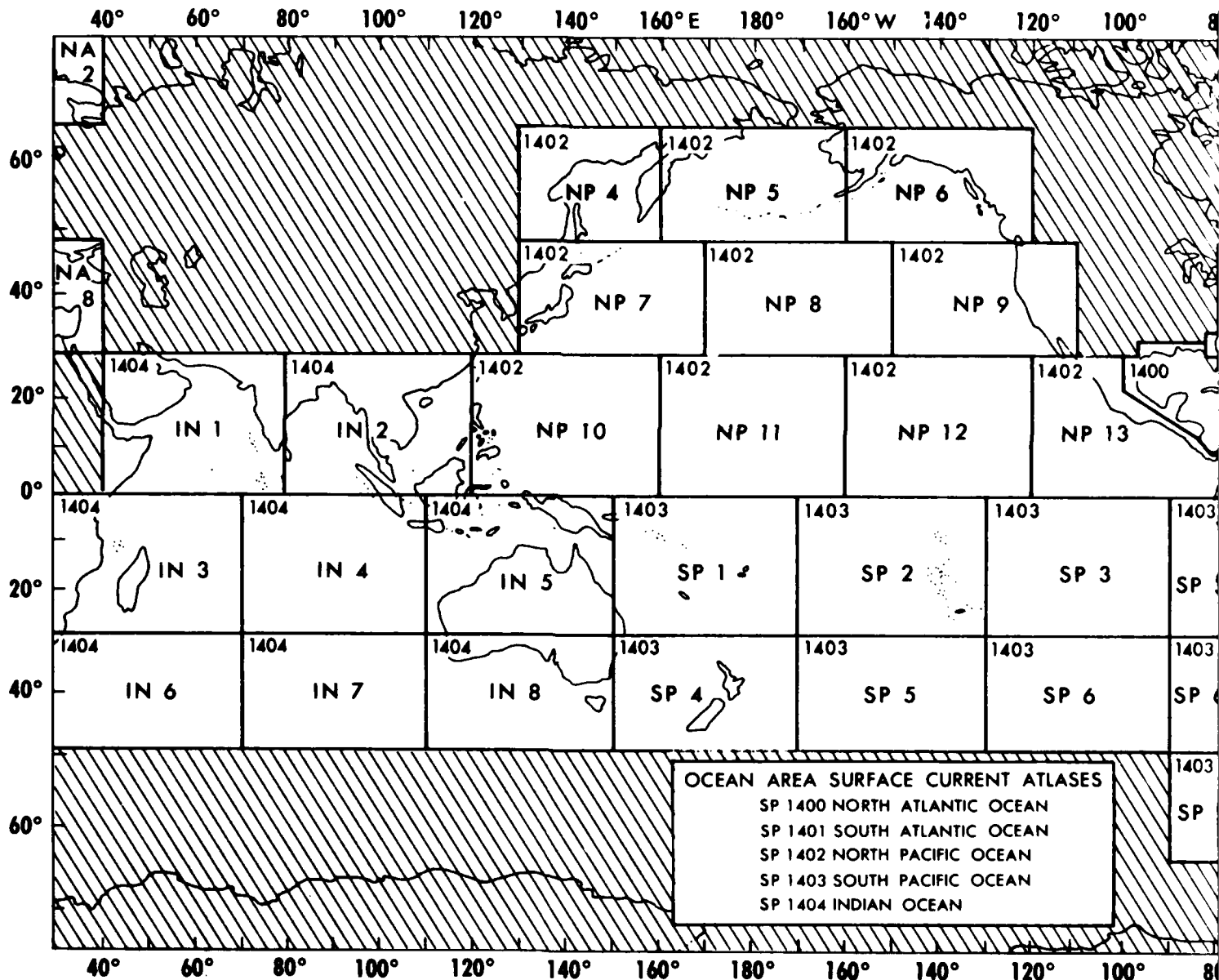
SURFACE CURRENT ATLASES

THIS SERIES OF COMPUTERIZED ATLASES REPLACES THE OLD HYDROGRAPHIC OFFICE ATLASES OF SURFACE CURRENTS (HOP 566, 568, 569, 570) WHICH WERE MANUALLY COMPILED FROM DATA OBTAINED DURING THE PERIOD 1903 - 1934. THESE NEW ATLASES CONFORM TO THE STANDARD NAVY OCEAN AREA AND REGION INDEX LIMITS SHOWN BELOW: e.g., N00 SP 1402-NP 10 COVERS NORTH PACIFIC REGION 10 EAST OF THE PHILIPPINES.

AS AMONGS THESE DATA...
 THESE GRAPHICS MAY
 AREAS OF THE NORTH SEA.
 CURRENTS ARE SEVERELY UN-
 PREDICTABLE BEYOND 100N.

RECENT IMPROVEMENTS IN THE DATA FILE ASSURE THE INCLUSION OF THE LATEST, HIGH QUALITY SURFACE CURRENT DATA AVAILABLE. THE FILE NOW CONTAINS MORE THAN 4,200,000 OBSERVATIONS AND A GENERAL UPDATE OF THE FILE WILL BE MADE.

INDEX



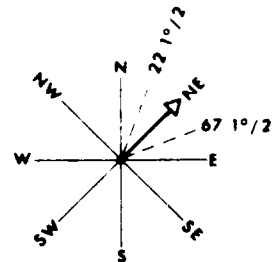
Introduction

The Surface Current Data File, from which these atlases are derived, consists primarily of over four million ship set and drift observations. These data were collected by the Netherlands, Japan, Britain, France, and the United States. The file is supplemented by several thousand Geomagnetic Electrokinetograph (GEK) observations, mostly Japanese. The file spans the period from the early 1850's to the present. The earliest observations were collected by the Netherlands and Great Britain; those of the 1960's through the present are primarily United States data.

If there are 12 or more
by vector resultants.

General Quality

The quality of this data file is considered high for this type of derived value. The data have been carefully screened for duplication; observations taken under adverse conditions (i.e. high winds and waves, time between observations greater than 12 hours) have been eliminated when warranted. Consideration was given to the reliability of the observer; doubtful shipboard computations of set and drift were edited; and observations with erroneous locations (mostly observations on land) have been eliminated. The accepted data are considered most useful when used collectively as in summaries where a number of observations show trends.

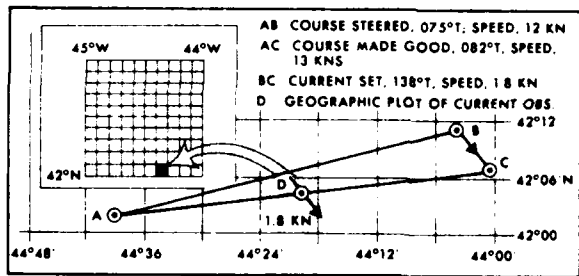


General Observation Technique

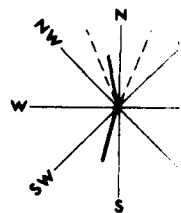
The set (direction) and drift (speed) are computed by the navigator from the difference between the dead reckoning (DR) position and the position determined by any type of navigational fix. The drift can be determined along any straight line track and includes all factors which cause changes in the DR position. When a fix is obtained, the current set (direction) is FROM the DR position TO the fix; the drift (speed) is equal to the distance in nautical miles between the DR and the fix, divided by the number of hours since the last fix. For successive observations, the TO POSITION of one observation becomes the FROM POSITION of the next observation.

- (1) Persistent Current - 60 percent or more of all observations fall within a 45° sector of the 8-point compass.

Because the influence of current may vary along a ship's track, the MEAN POSITION of the track is assigned as the geographic location of the current observation. An example of a current computation is shown in the figure below.



EXAMPLE OF A SURFACE CURRENT (SHIP'S DRIFT) OBSERVATION



Data Presentation

The following legend shows two types of surface current presentations by 1° quadrangle, type 1 with 12 or more observations and type 2 with fewer than 12 observations. Where there are 11 or fewer observations within a 1° quadrangle, the total number of observations is shown within the 90° quadrant containing the observations.

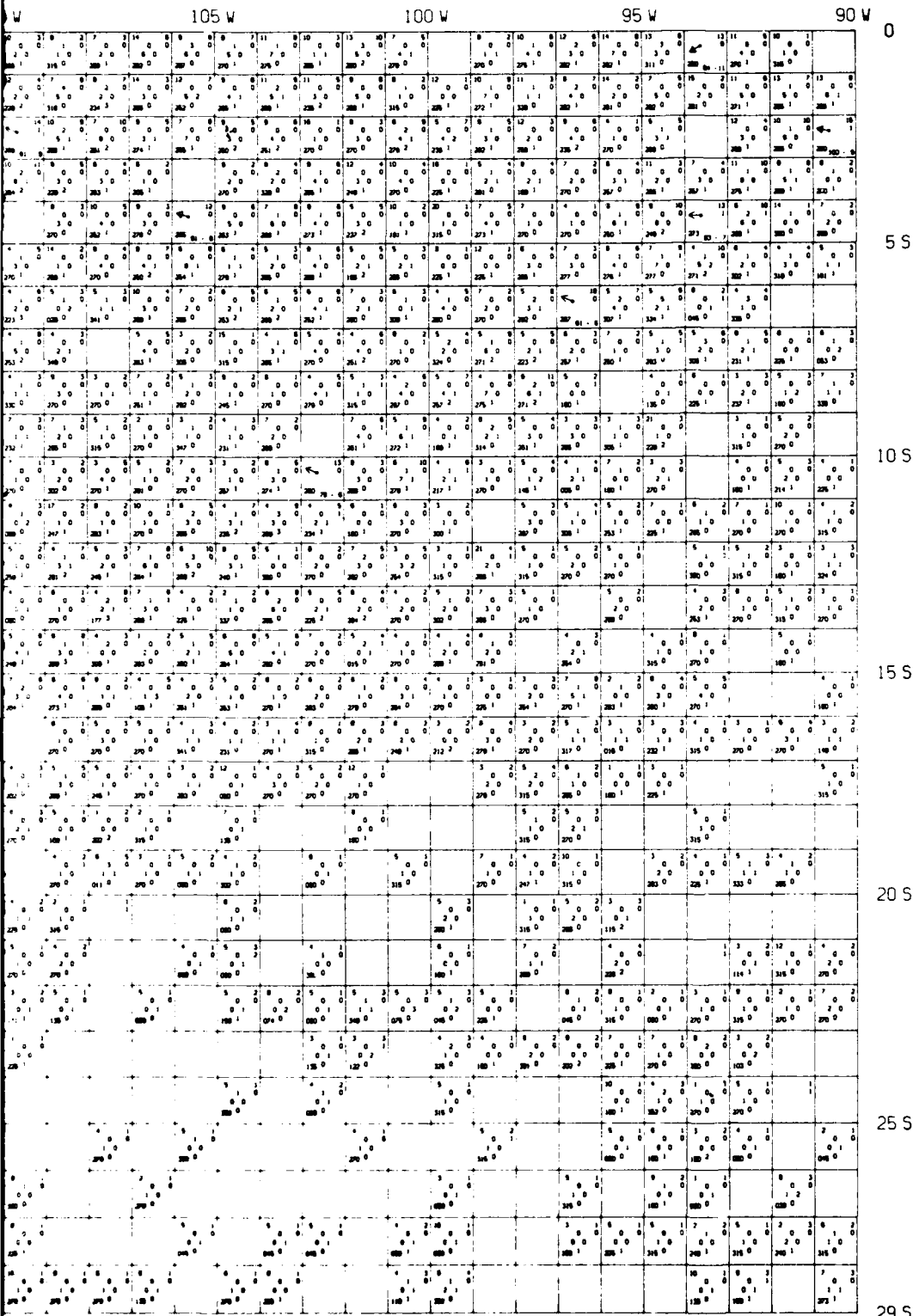
- (4) Bizonal Flow - Practically all are concentrated in opposite sectors, and one pair contains 80 percent as many observations as the other pair. This generally indicates that occurs in zones of entraining opposing currents (see example quadrangles 1, 2, and 3).

LEGEND

TYPE 1

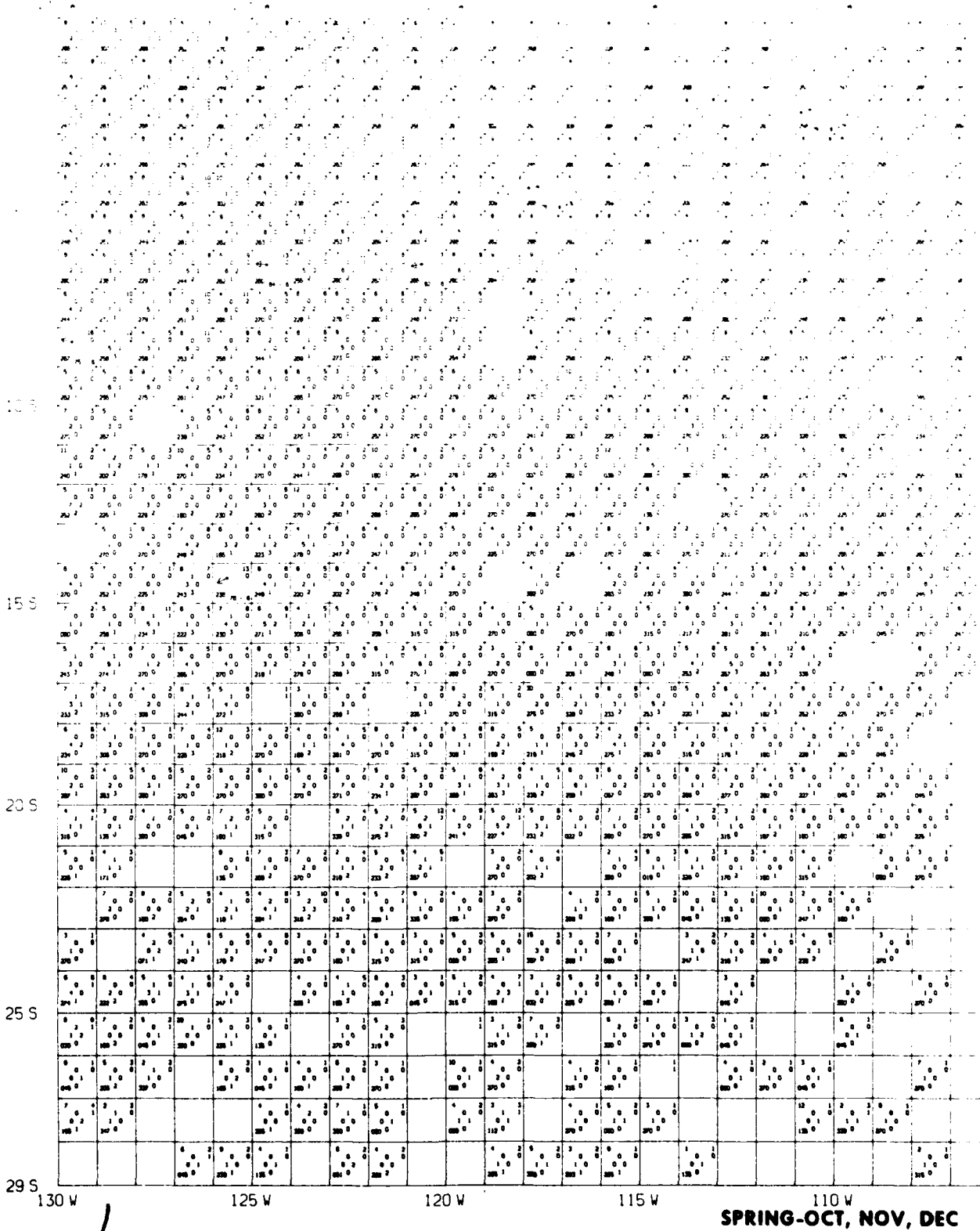
TYPE 2

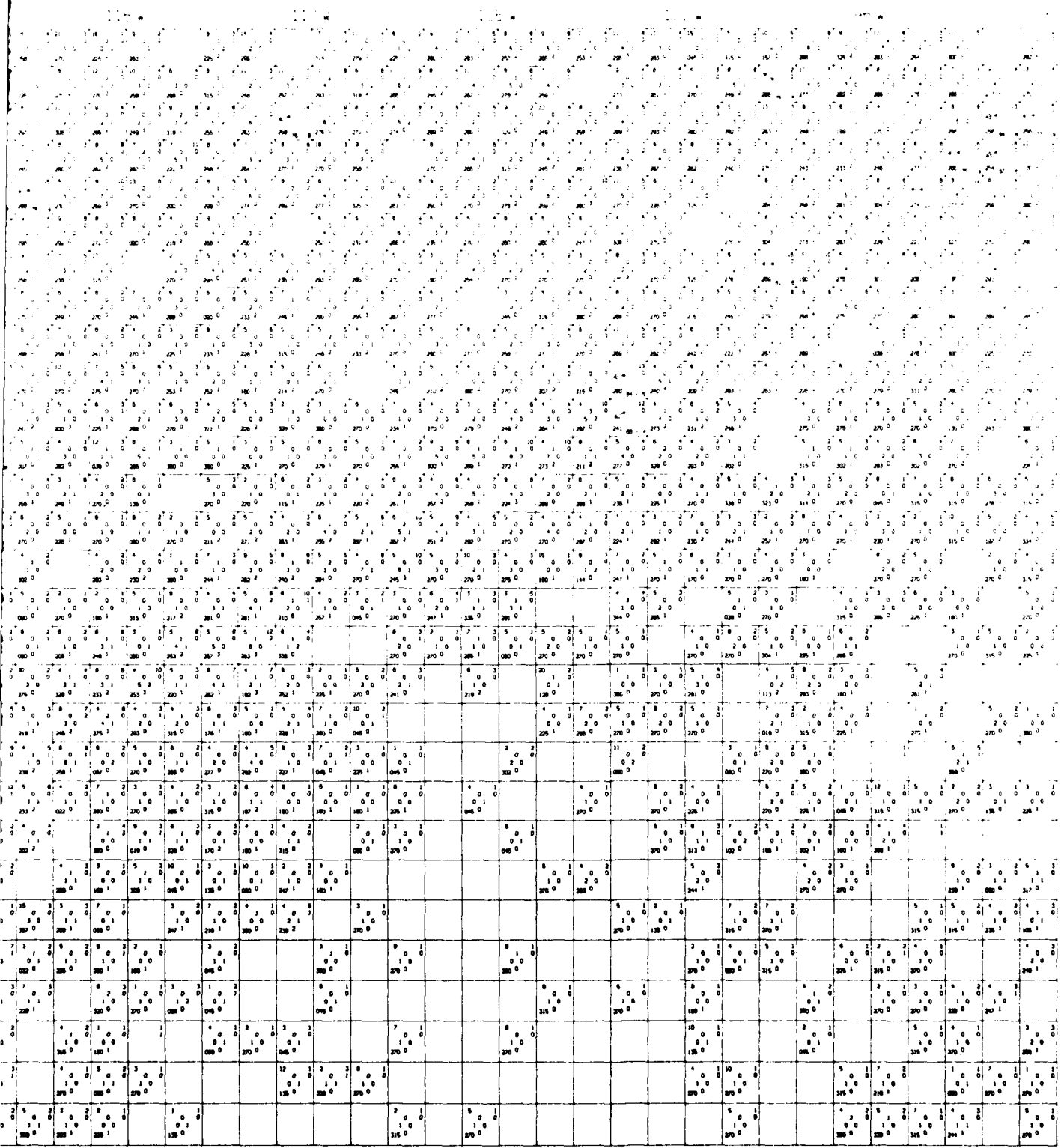
- A NUMBER OF CALMS (INCLUDED IN TOTAL OBSERVATIONS).
- B TOTAL OBSERVATIONS (999 ALSO USED FOR 1000 OR MORE OBSERVATIONS).
- C MEAN SPEED (0.8 KNOT) FOR ALL OBSERVATIONS.
- D VECTOR RESULTANT DIRECTION (°T) FOR ALL OBSERVATIONS.
- E PERCENT FREQUENCIES (57% PRIMARY DIRECTION, 23% SECONDARY DIRECTION).
- F MEAN SPEEDS (1.0 KNOT PRIMARY DIRECTION, 0.6 KNOT SECONDARY DIRECTION).
- G NUMBER OF OBSERVATIONS BY QUADRANT.



L, AUG, SEP

2





115 W

110 W

105 W

100 W

95 W

90 W

SPRING-OCT, NOV, DEC

25 S

29 S

2

130 W

125 W

120 W

115 W

110 W

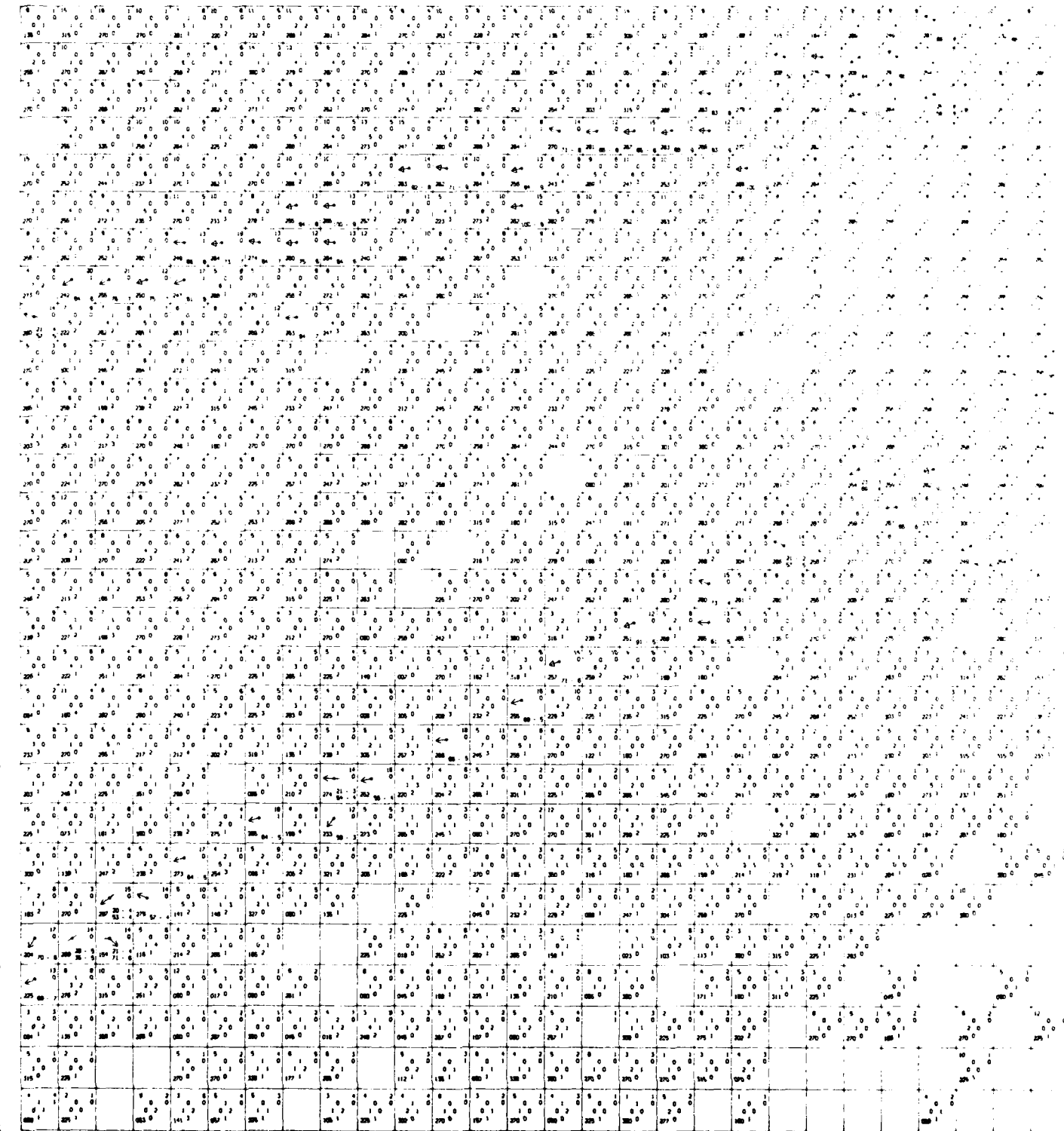
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15 S

20 S

25 S

29 S



130 W

125 W

120 W

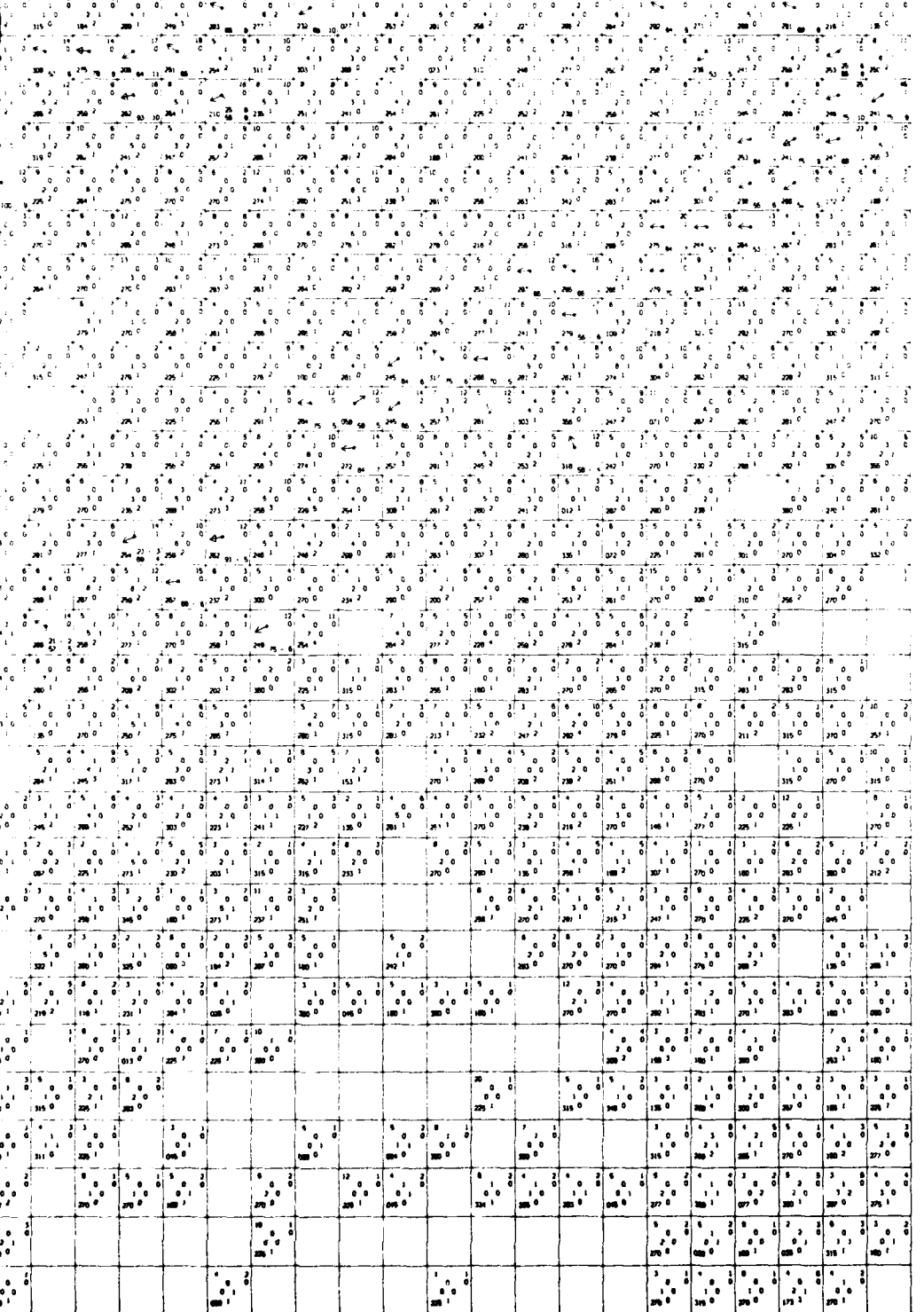
115 W

110 W

105 W

SUMMER-JAN, FEB, MAR

110 W 105 W 100 W 95 W 90 W

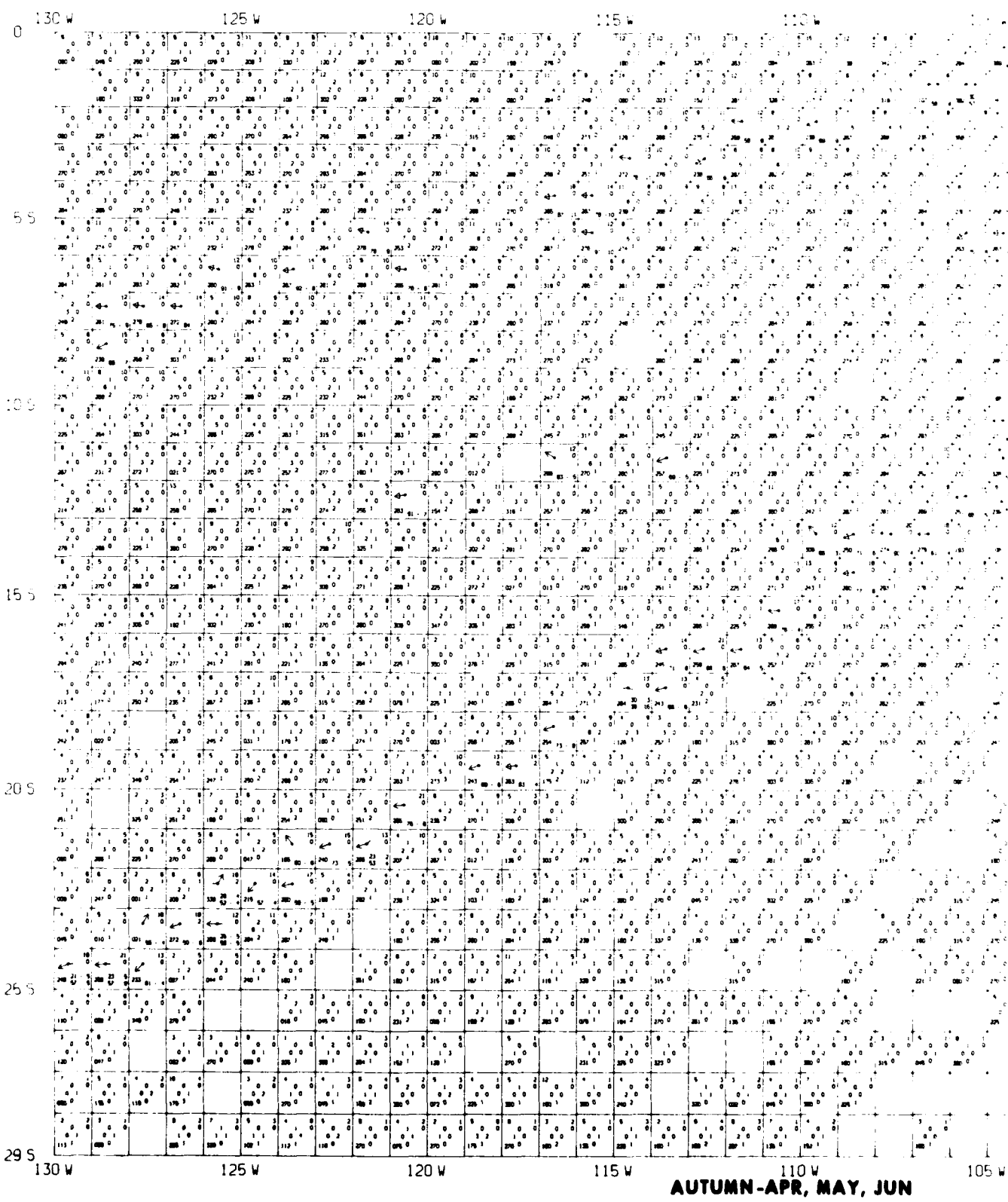


0
10 S
15 S
20 S
25 S
29 S

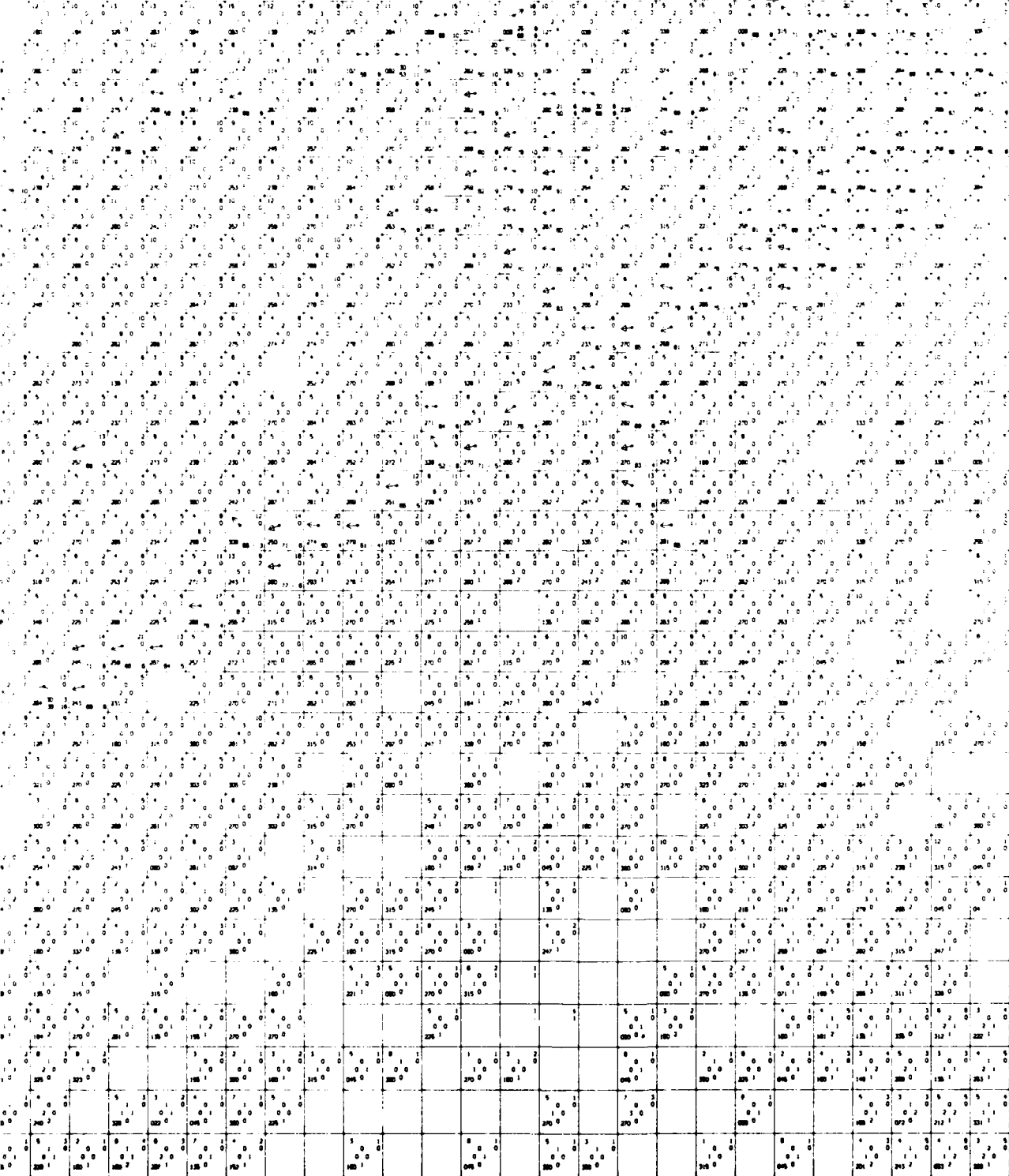
110 W 105 W 100 W 95 W 90 W

-JAN, FEB, MAR

2



115 W 110 W 105 W 100 W 95 W 90 W



20 S

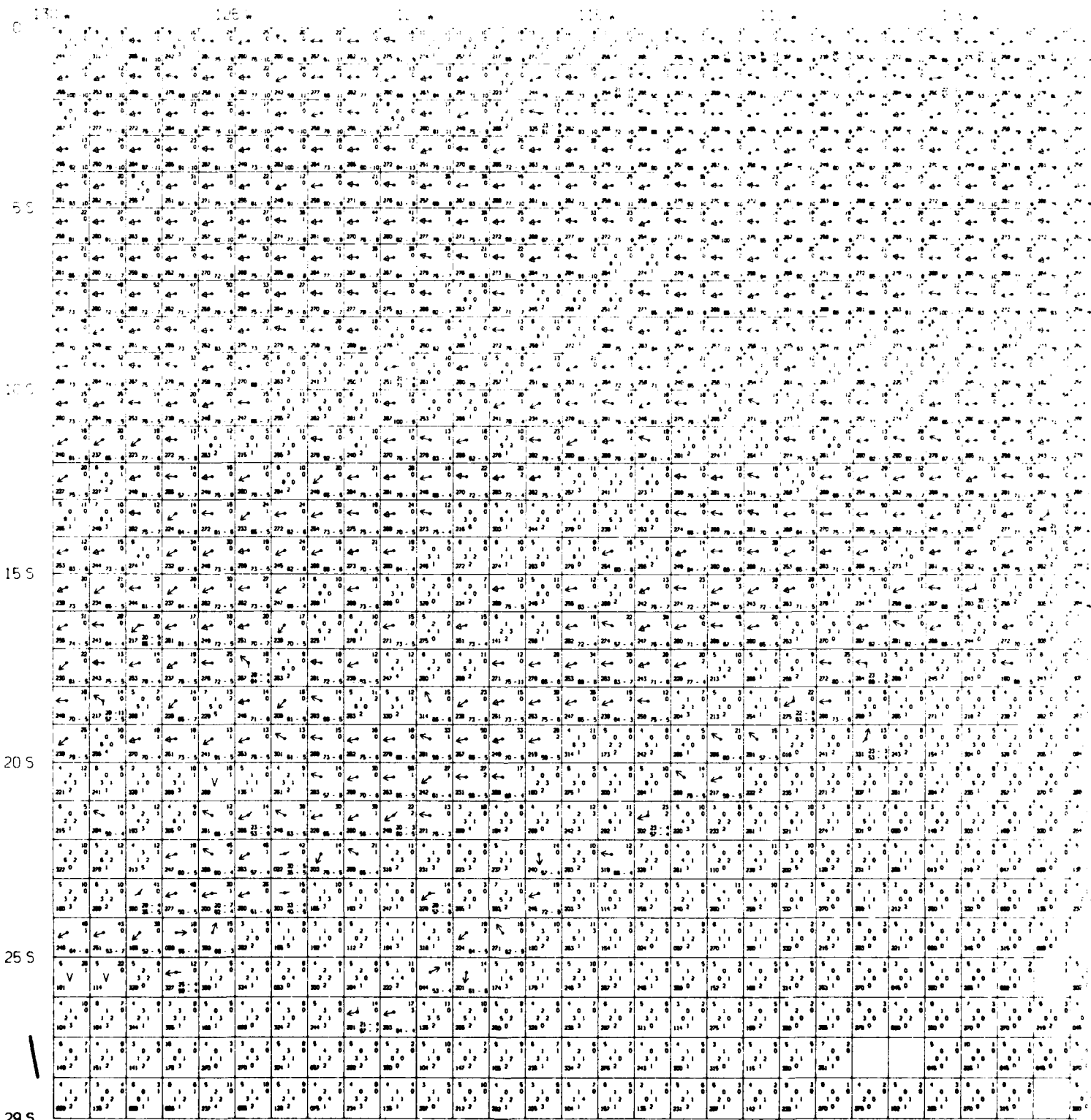
25 S

30 S

115 W 110 W 105 W 100 W 95 W 90 W

AUTUMN-APR, MAY, JUN

2



ANNUAL-JAN THROUGH DEC

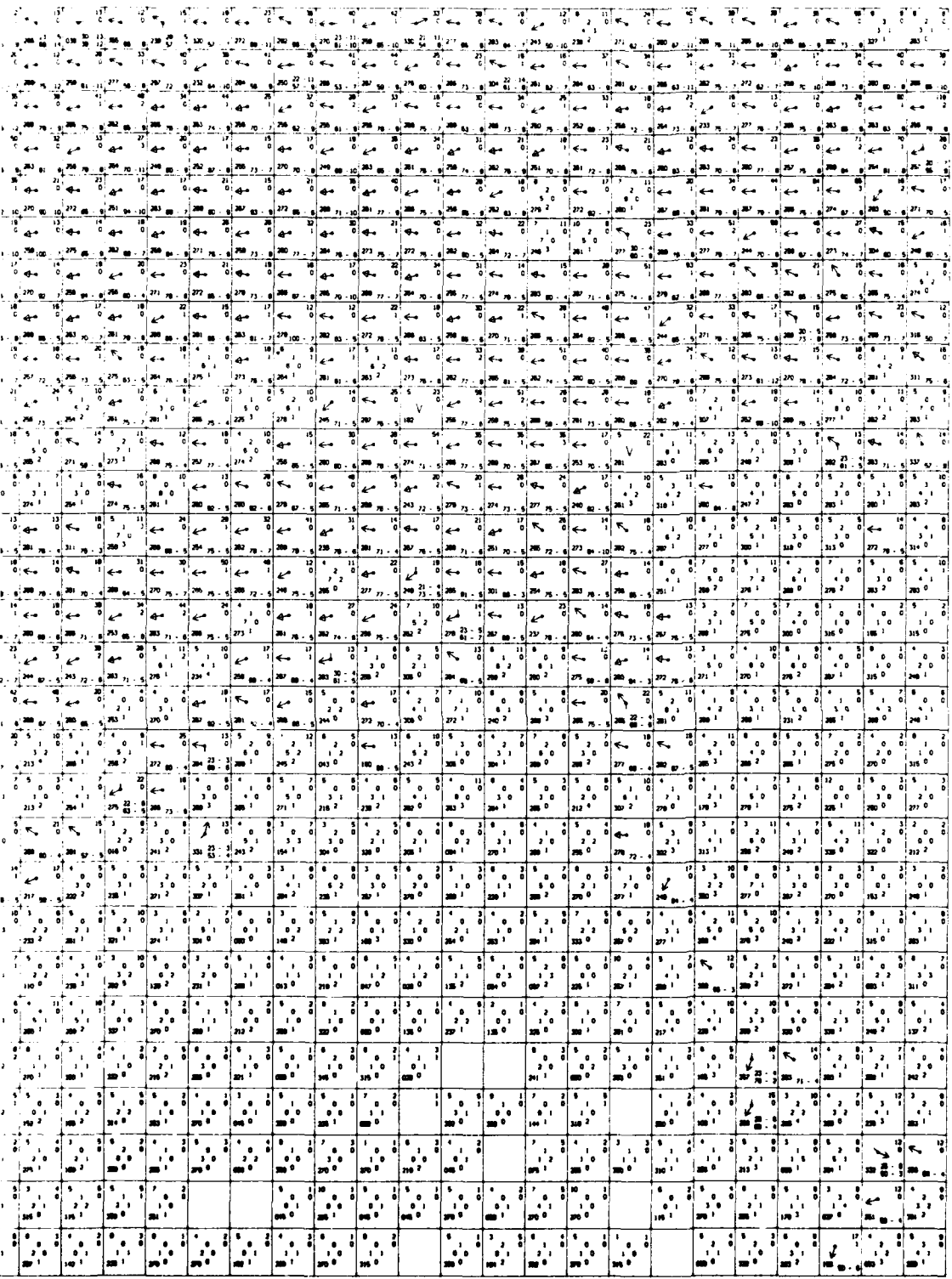
110 W

105 W

100 W

95 W

90 W



5 S

10 S

15 S

20 S

25 S

29 S

2

110 W

105 W

100 W

95 W

90 W

UAL-JAN THROUGH DEC

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This atlas, and the series of which it is a part, is computer generated and automatically plotted. It makes available to the user the most recent surface current data collected and will be updated whenever sufficient amounts of data are added to the data file. This and the other atlases are based on a vast quantity of data as compared to the previous manually-compiled editions printed in the mid-thirties.			

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20. Cont. The surface current information is based mainly on ship drift, which is the difference between the dead reckoning position and the position determined by any type of navigational fix. This difference describes the direction and speed of the current.

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