Annex 5 – Prediction of Oil Movement

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Prediction of oil movement

Oil moves at approximately 100% of surface current and 3% of wind speed. The influence of 3% of the wind speed combined with 100% of the current speed results in the movement of oil from A to B.

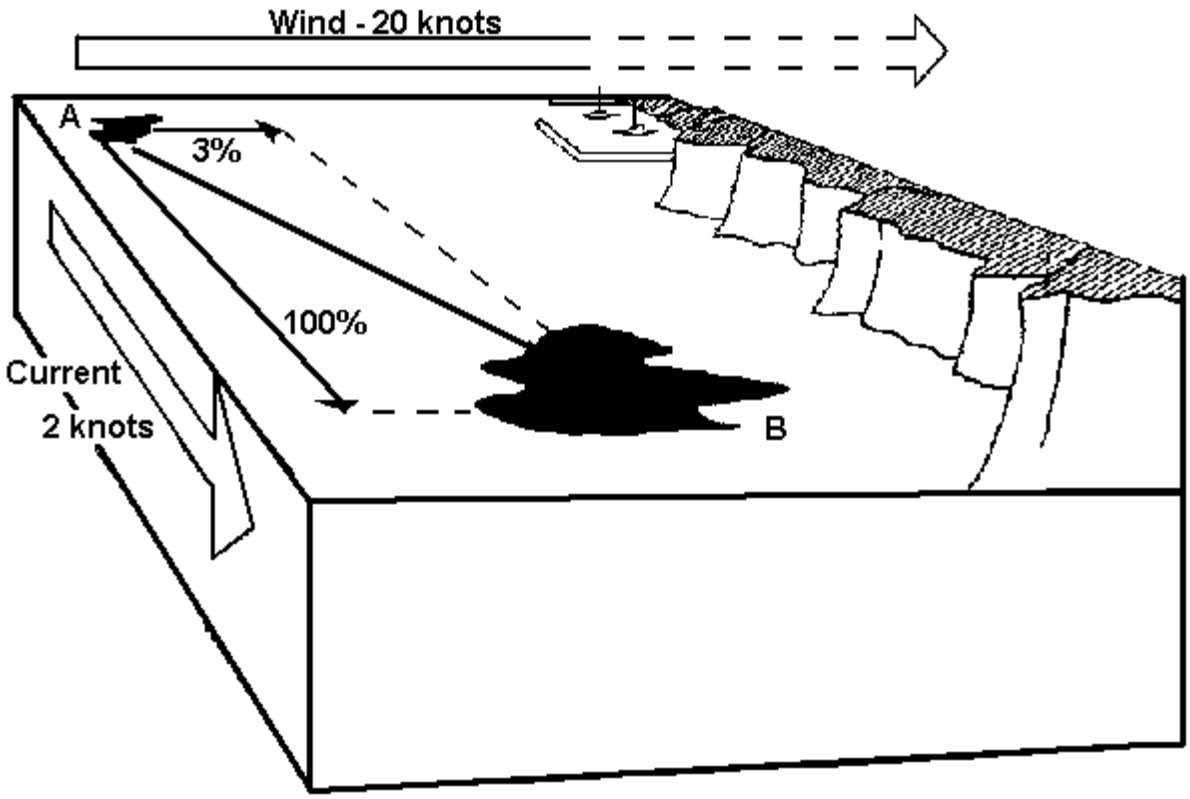

Figure 1 Movement of the slick

NOTE: Winds blow FROM the specified direction whereas currents flow TOWARDS the specified direction.

A cautionary note: this calculation will not predict the movement of emulsified slicks (mousse). The ADIOS computer program can be used to predict the changes in physical and chemical characteristics of the slick over time. Hence, it may be used to predict when mousse formation may occur (NB – ADIOS predictions have not been checked against actual oil weathering and should be used with caution).

Tides, currents and wind

There is limited data available about surface currents on the Bay of Plenty coast with the exception of Tauranga Harbour. Detailed current information for Tauranga Harbour is found at the end of this annex but is meant for quick reference only. The best detail is held in the Chart Desk in the Maritime Meeting Room, Level 1, Regional House, Bay of Plenty Regional Council Office. In the Chart Room, there is a full marine chart portfolio for the entire upper North Island from Napier in the east to Taranaki in the west. Charts must be corrected prior to use.

Broad tidal stream and current predictions are contained in Hydrographic Charts and should be used in conjunction with tide tables for the appropriate day. Additional current information can be obtained from the New Zealand Tidal Streams Atlas (refer next pages) or from the Land Information New Zealand (LINZ) website ***www.linz.govt.nz/hydro***. Special tidal forecasts can be obtained from NIWA.

The appropriate Hydrographic Charts are available at the Emergency Operations Centre (EOC) or in the Harbour Master's office. Tide tables and tidal streams (offshore current) information is outlined in this annex.

Local harbour knowledge can be obtained from the Bay of Plenty Regional Council Harbour Master or the Duty Pilot at Port of Tauranga. A useful website for wind, tide and current information is ***http://www.port-tauranga.co.nz/Harbour-Conditions***

Wind speed and direction may also be obtained for the site of the spill from local police, coastguard, residents, airport, or fishing and recreational boats.

It is strongly recommended that emphasis be placed on monitoring the actual movement of an oil spill, to validate any predictions made during the spill response.

Weather forecasts

Severe weather information for the region can be obtained from: Marine Forecaster, Meteorological Office.

Marine Forecaster, Meteorological Office	04 470 0783 (6:00 am–9:00 pm) or
	04 470 0794 (9:00 pm–6:00 am)
Website	***www.metservice.co.nz***

Sea surface temperatures

Sea Surface information is available on line, or by contacting the Met Service Office on numbers above.

Tide charts

Note: The information provided in the following charts is for quick reference only, more detailed information is provided in the New Zealand Nautical Almanac. For current copies, speak to a member of the Maritime Team.

Tidal Stream Atlas
New Zealand

Published by the Hydrographic Office, Royal New Zealand Navy, under the Superintendence of Commander W.D. Frisken, RN, Hydrographer. In association with GP Publications Ltd, Wellington.

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The Charts

This atlas contains 3 sets of 13 charts showing tidal streams at hourly intervals commencing 6 hours before HW and ending 6 hours after HW, based on the times of HW at Auckland, Wellington and Bluff respectively.

The times of the HW should be obtained from the New Zealand Nautical Almanac, published by the Hydrographic Office RNZN.

On the charts the directions of the tidal streams are shown by arrows which are graded in 4 different lengths to indicate the approximate strength of the tidal stream as follows:

→	less 0.25 knot
⟶	0.25 to 0.75 knot
⟶	0.75 to 1.5 knot
⟶	over 1.5 knot

The figures against the arrows give a mean spring and neap rate in tenths of a knot, thus 16,07 indicates a mean spring rate of 1.6 knots and a mean neap rate of 0.7 knots. Where one figure only is given, such as 04, this indicates an average rate of 0.4 knots.

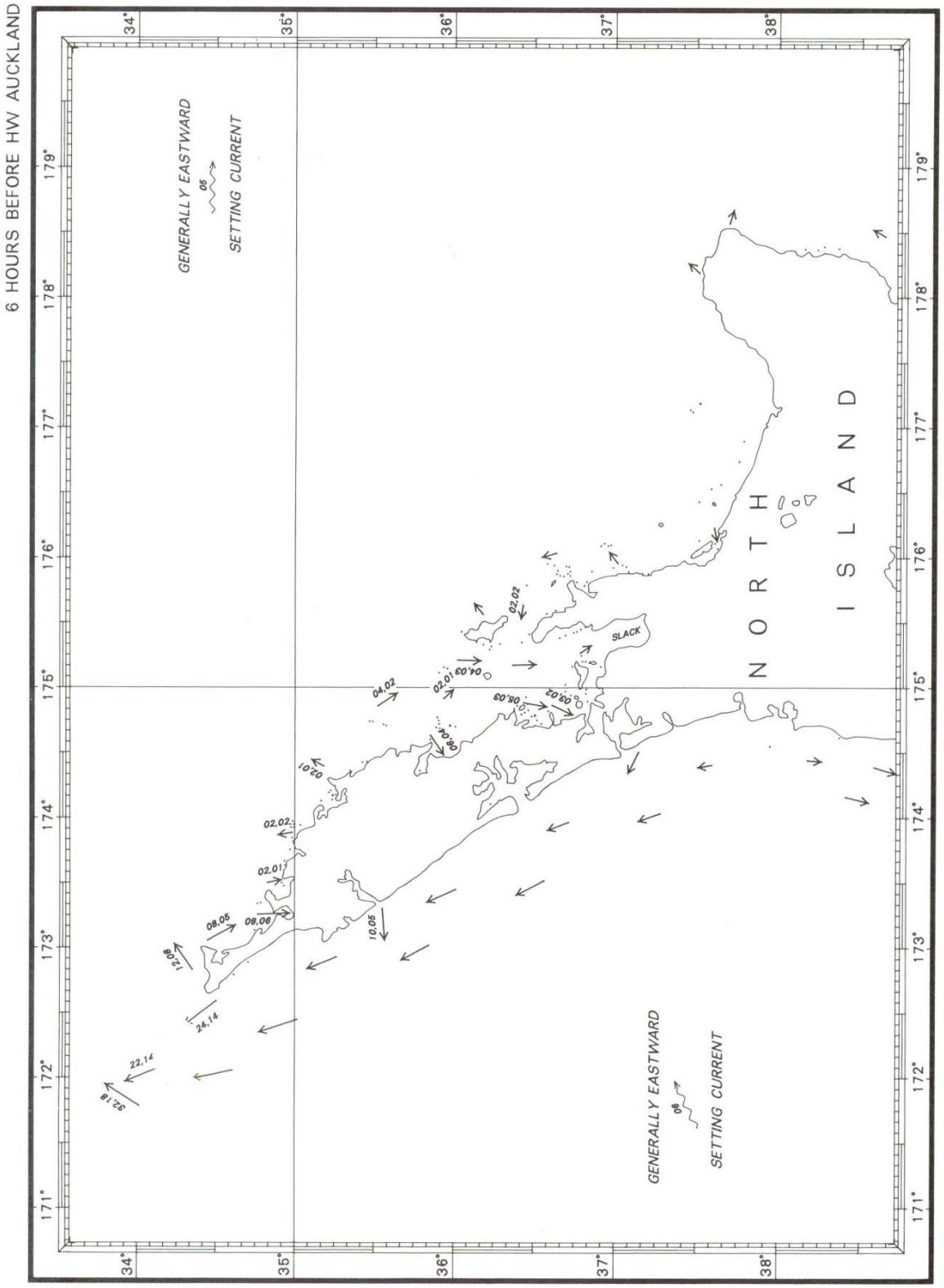
Offshore currents are shown by a wavy arrow, together with the average rate in tenths of a knot. Nearshore currents are incorporated in the tidal stream arrows.

Tidal streams and currents in New Zealand waters are much influenced by wind conditions and both strength and direction may vary appreciably.

Local tide rips and eddies are not shown. For details see official RNZN Charts and Admiralty Sailing Directions.

In the interests of improving the accuracy of this publication for use during search and rescue operations and to mobilize pollution control equipment at the most appropriate location in the event of an oilspill or other pollutant accident, additional information is always welcome. Information or queries should be sent to:

Hydrographer RNZN
19 Burns Avenue
PO Box 33-341
Takapuna
Auckland 9 Tel (09) 489 7227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GENERALLY EASTWARD
SETTING CURRENT
NORTH ISLAND
SLACK
34°
35°
36°
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172°
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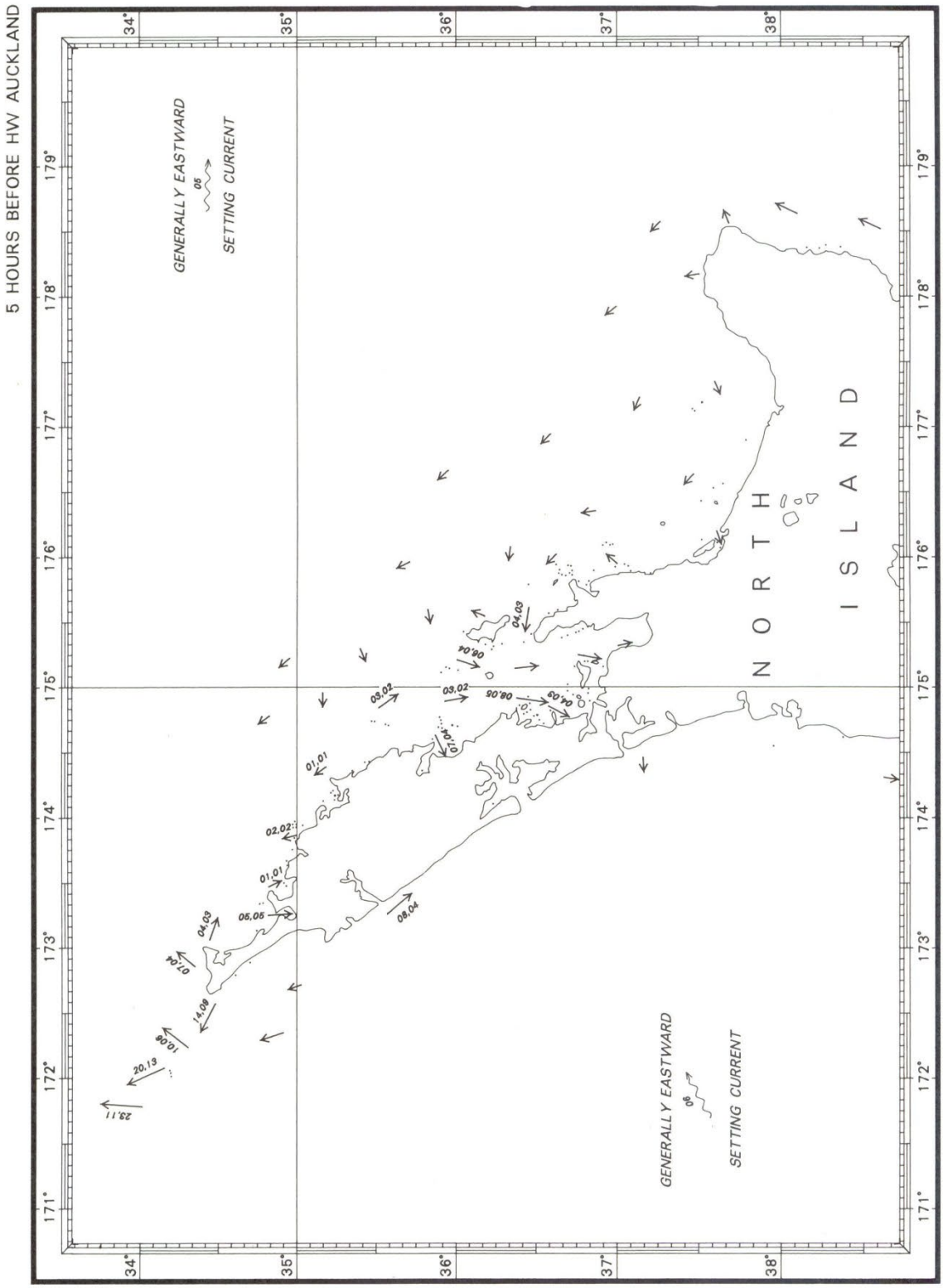
5 HOURS BEFORE HW AUCKLAND
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SETTING CURRENT
NORTH ISLAND
GENERALLY EASTWARD
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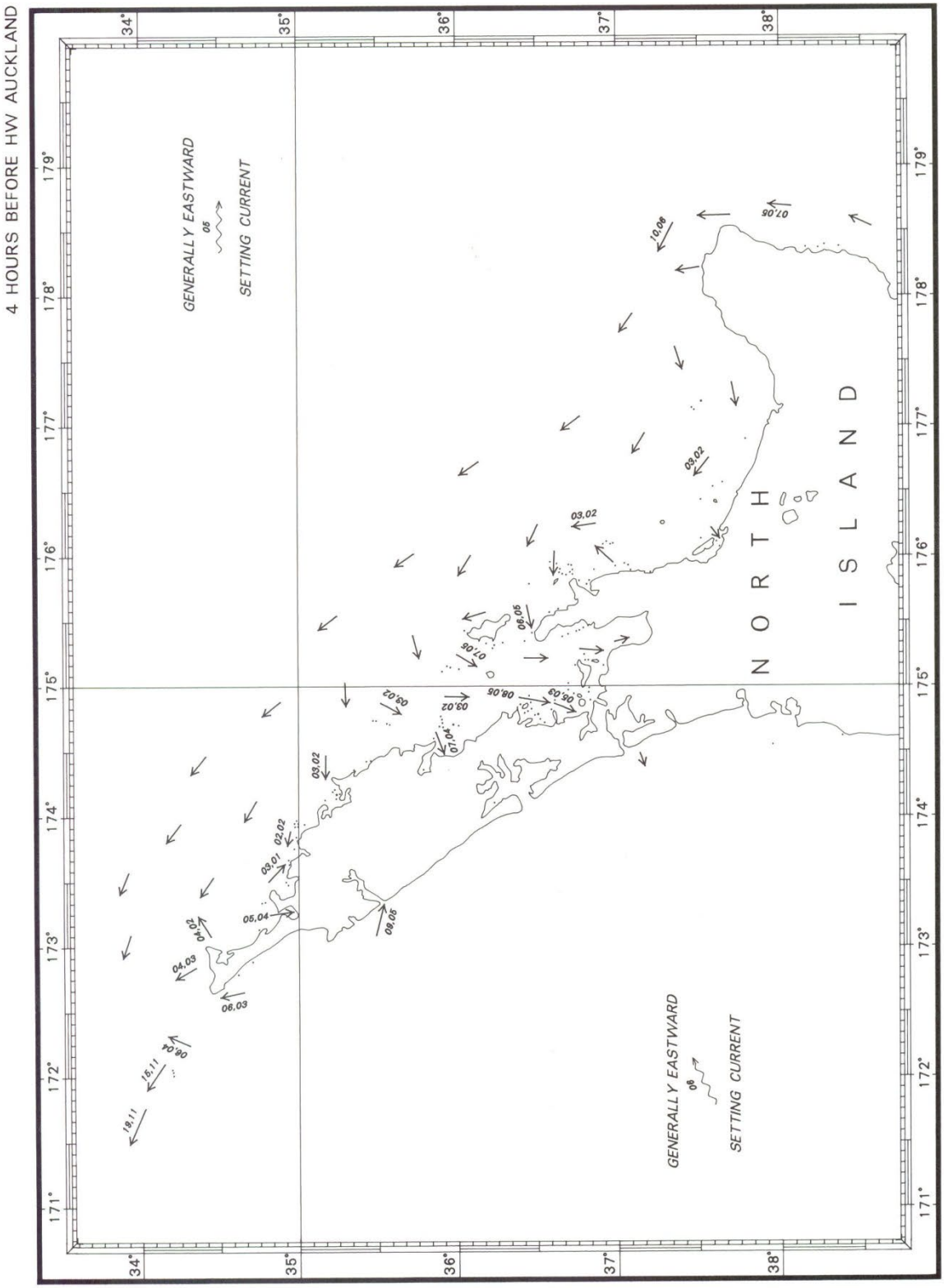
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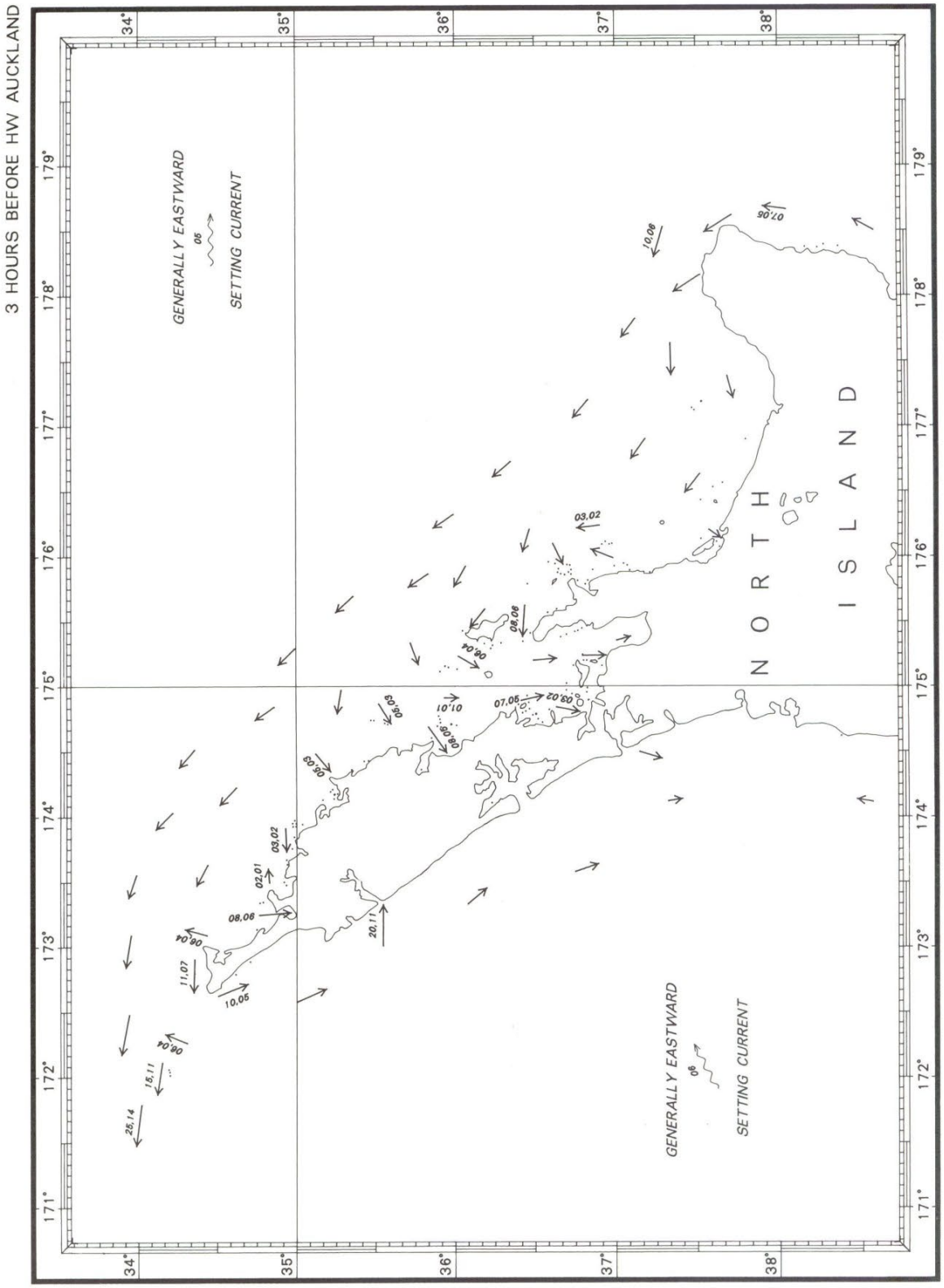
SETTING CURRENT
NORTH ISLAND
GENERALLY EASTWARD
SETTING CURRENT


3 HOURS BEFORE HW AUCKLAND
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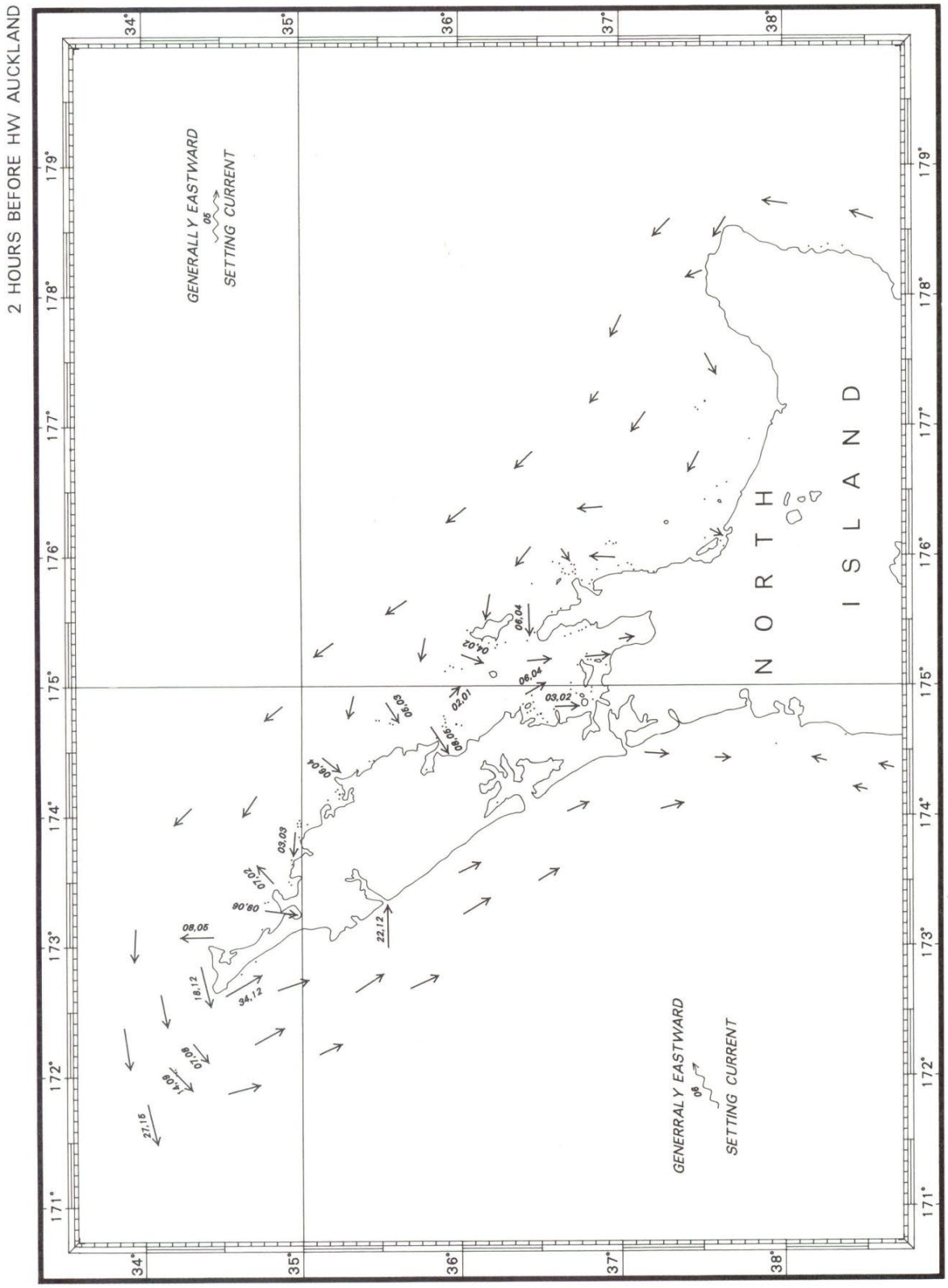
2 HOURS BEFORE HW AUCKLAND
GENERALLY EASTWARD
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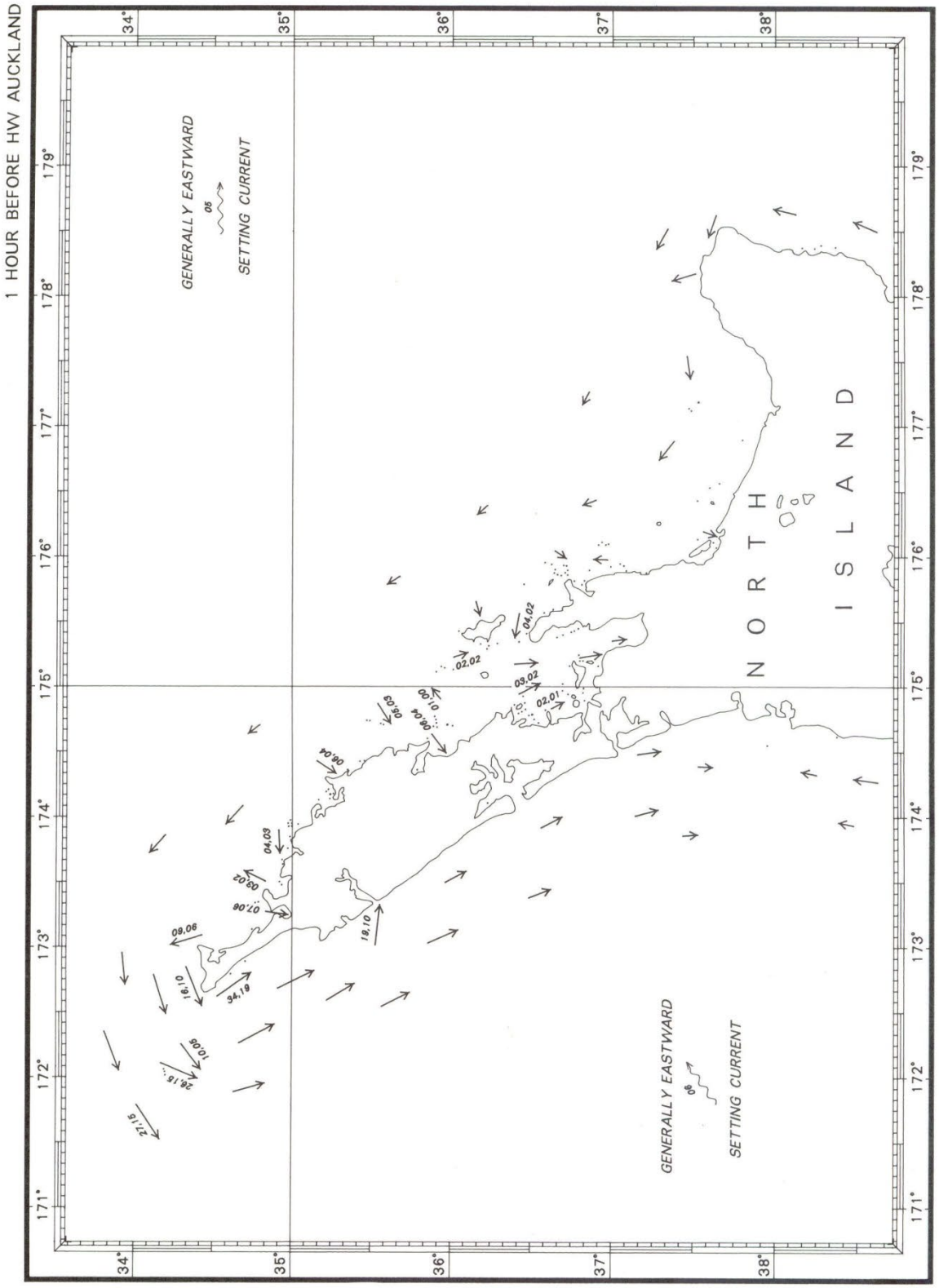
1 HOUR BEFORE HW AUCKLAND
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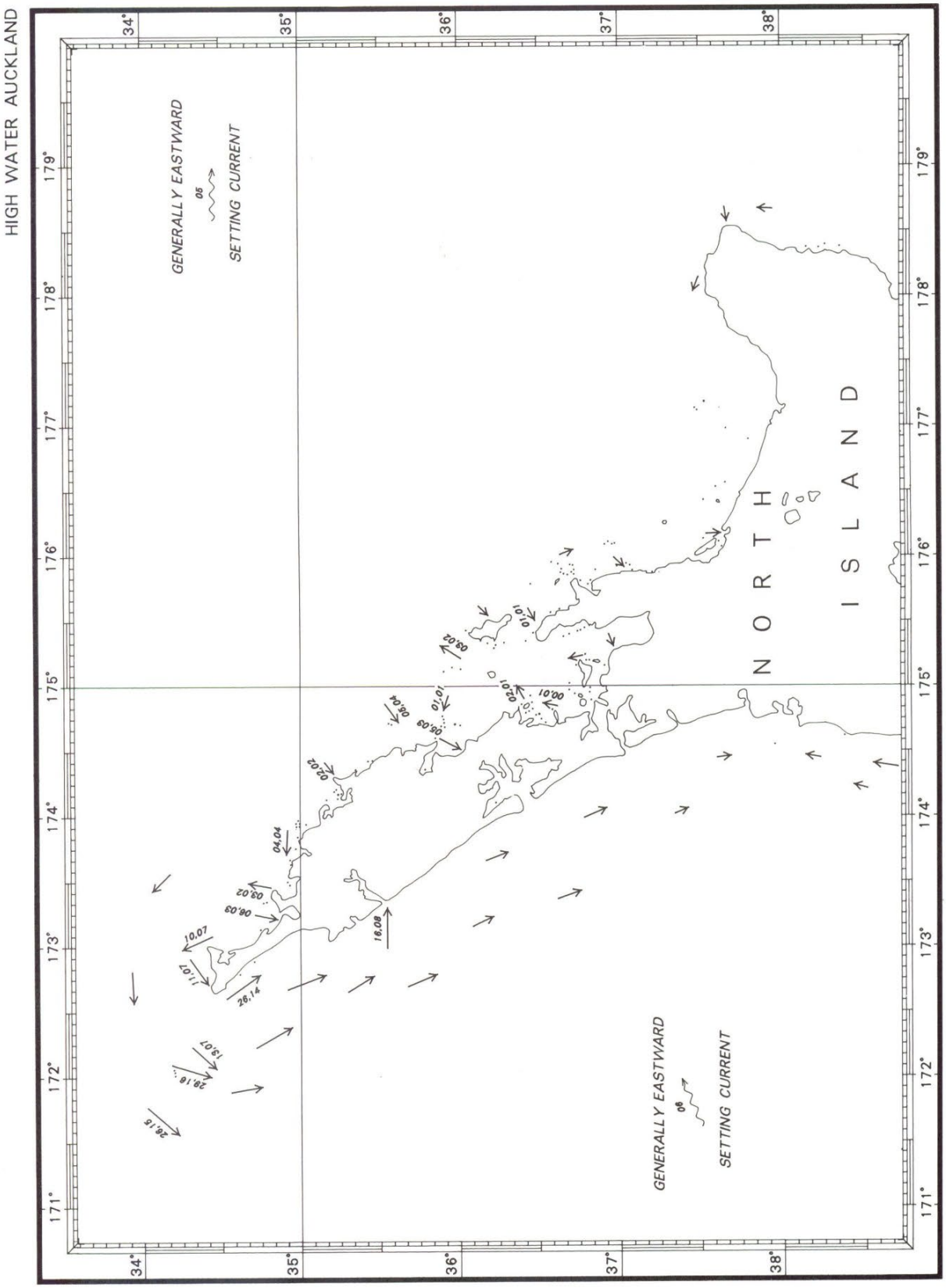
HIGH WATER AUCKLAND
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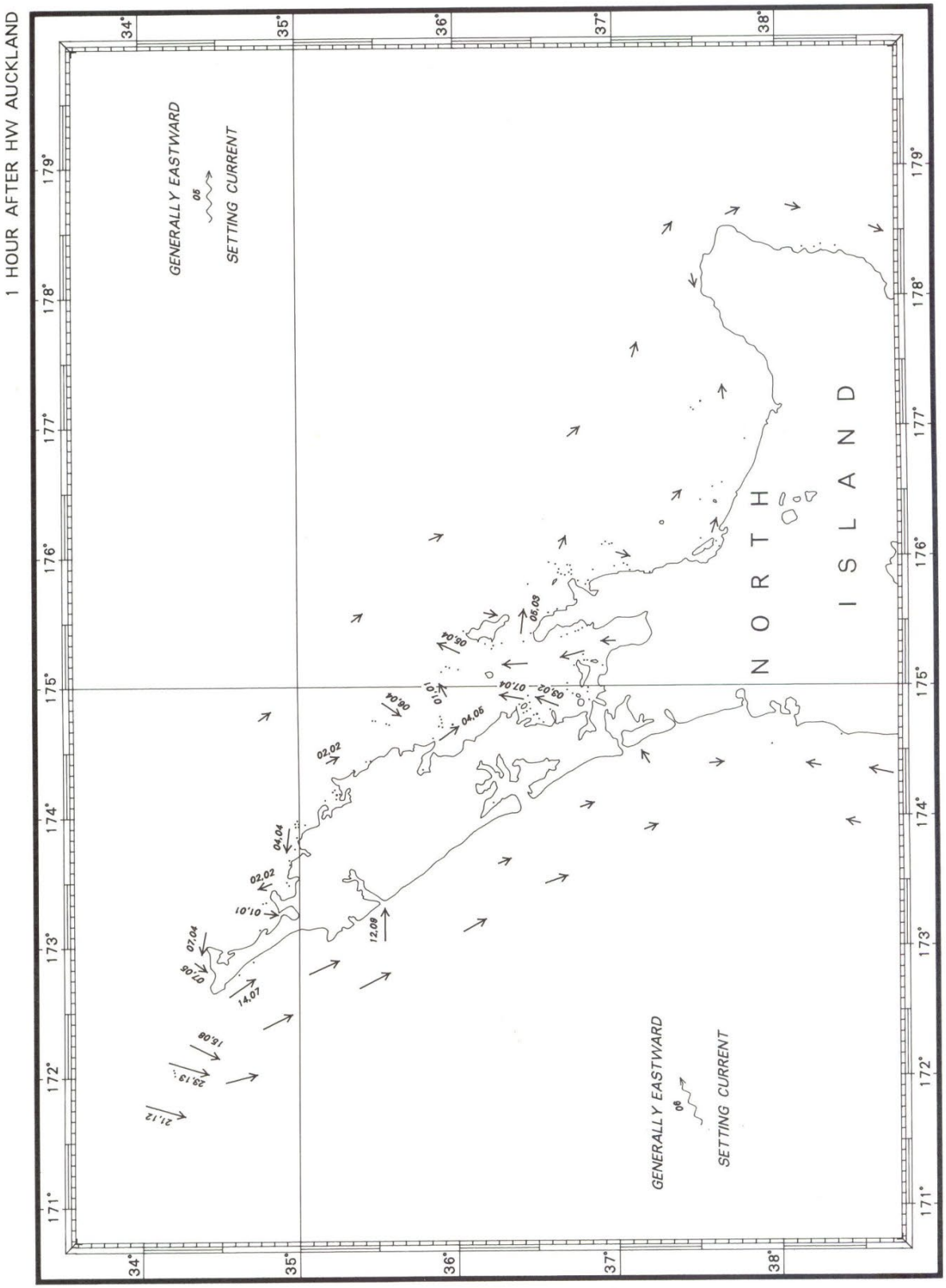
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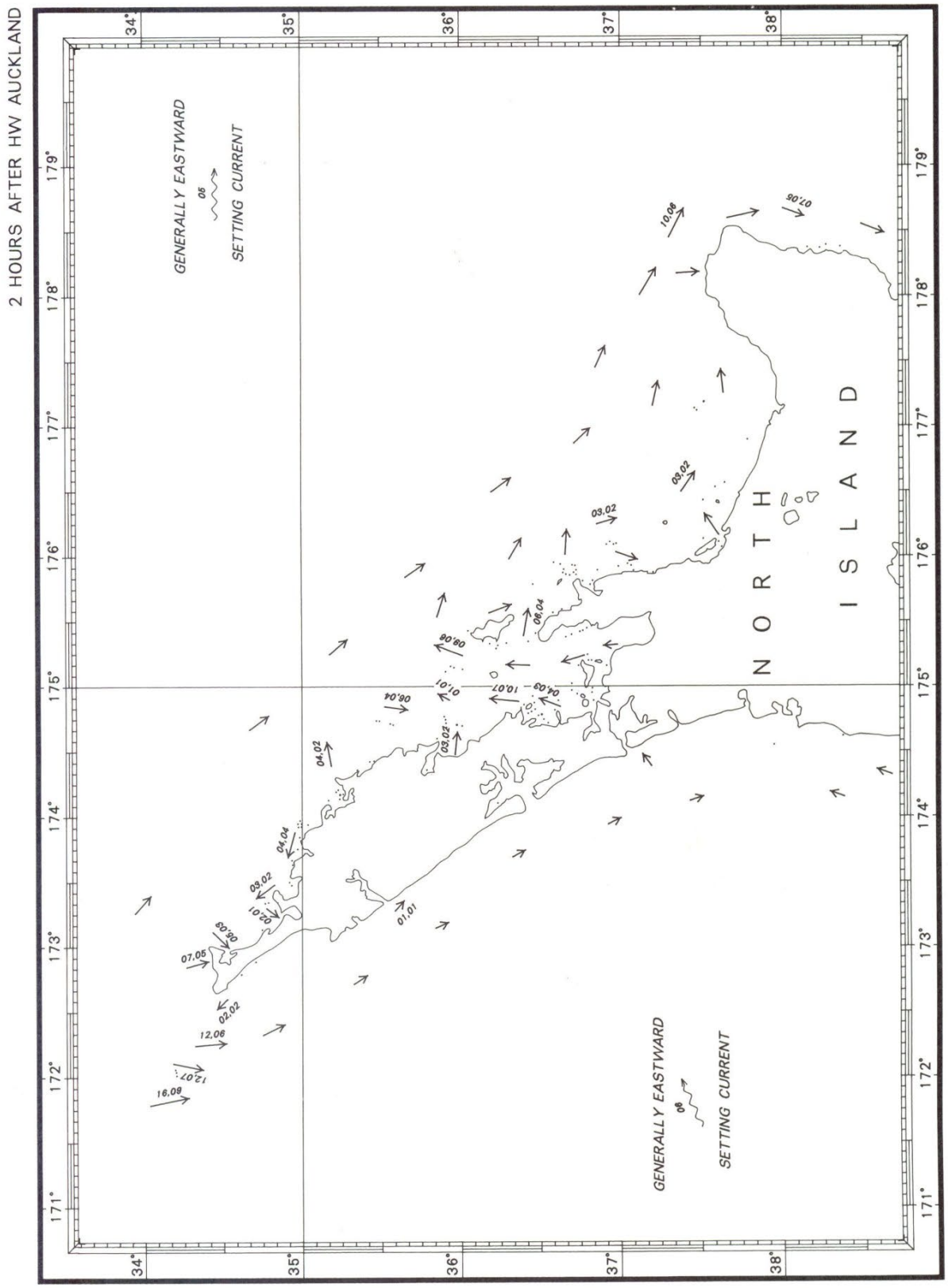
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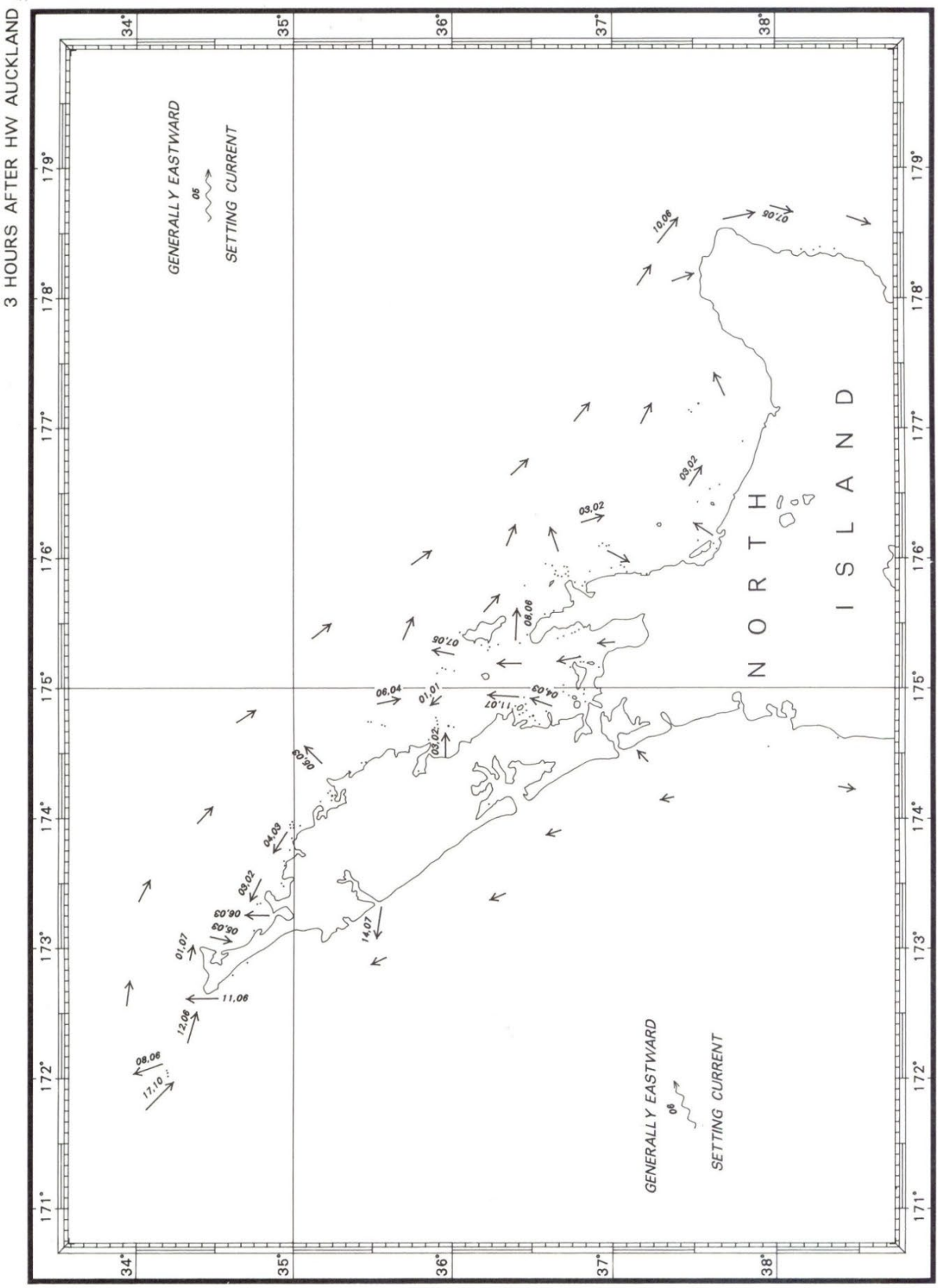
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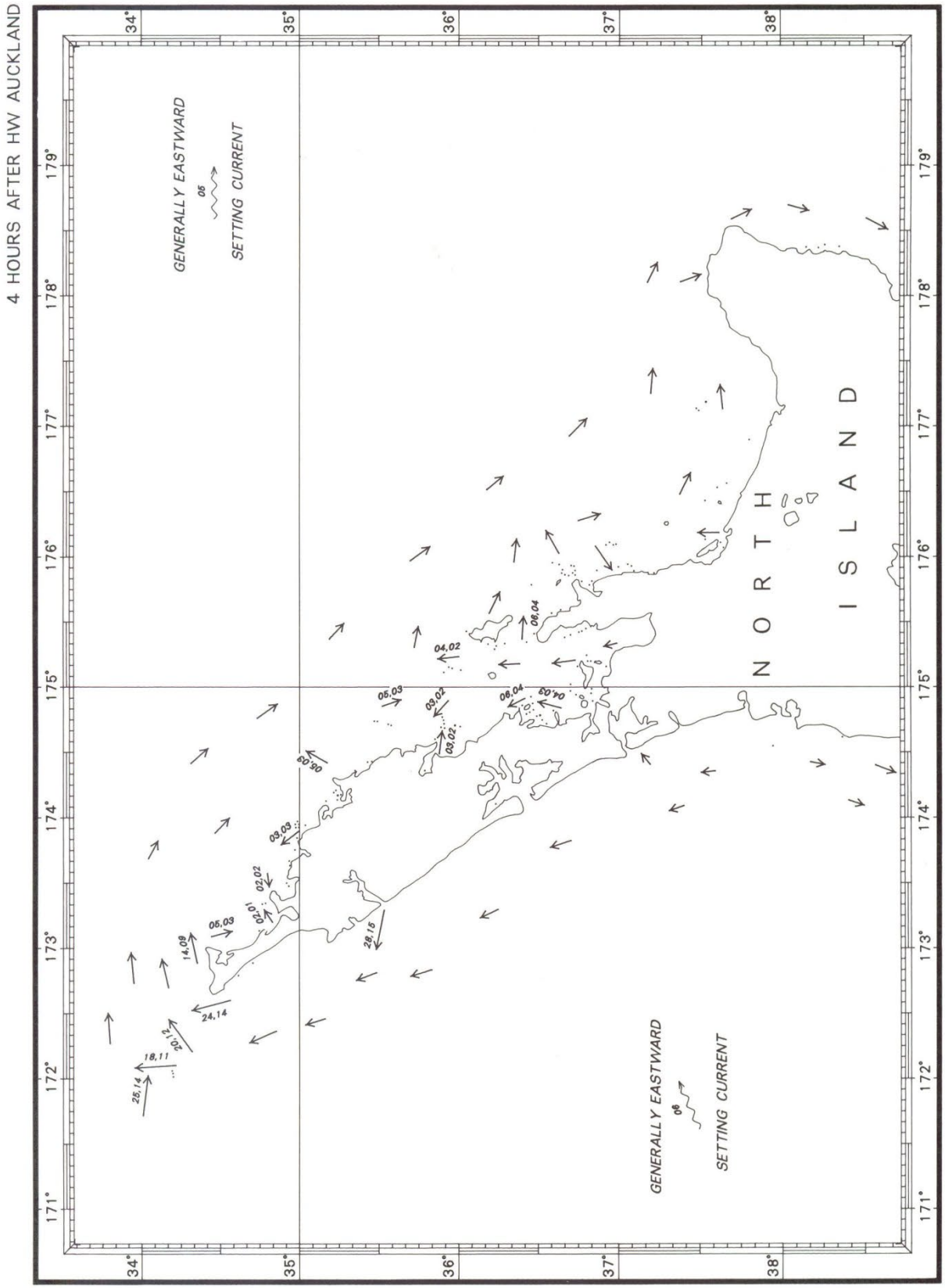
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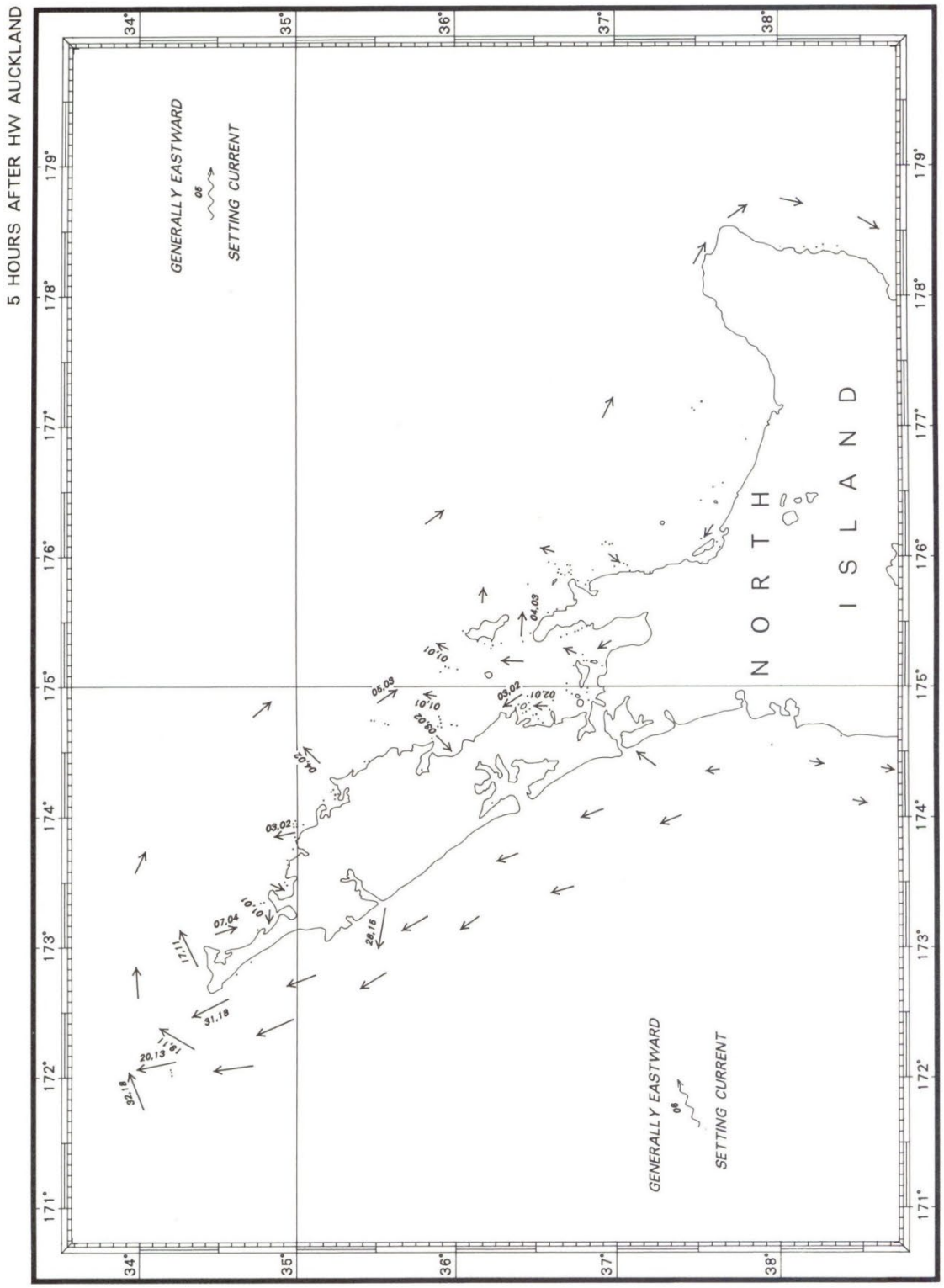
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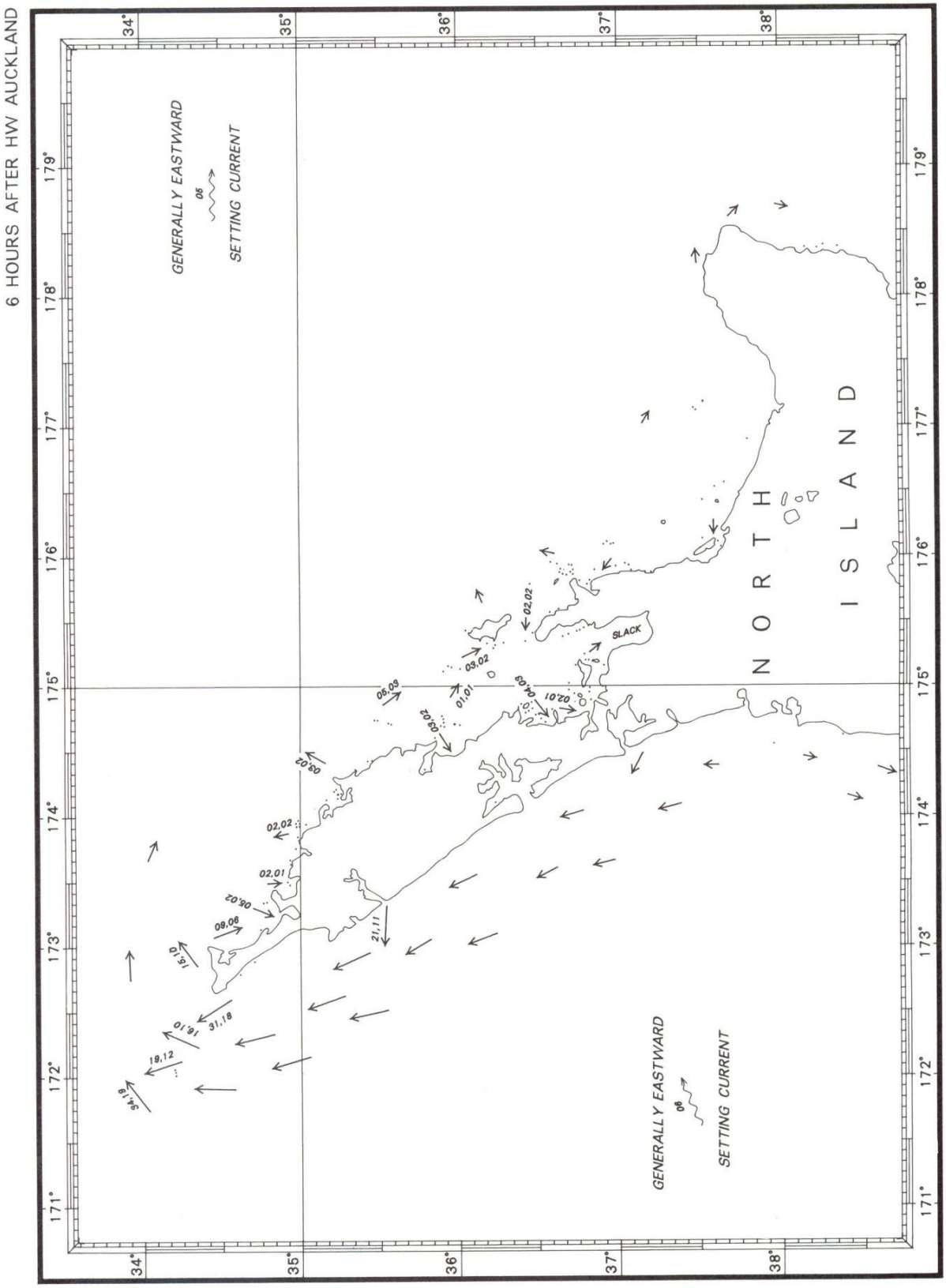
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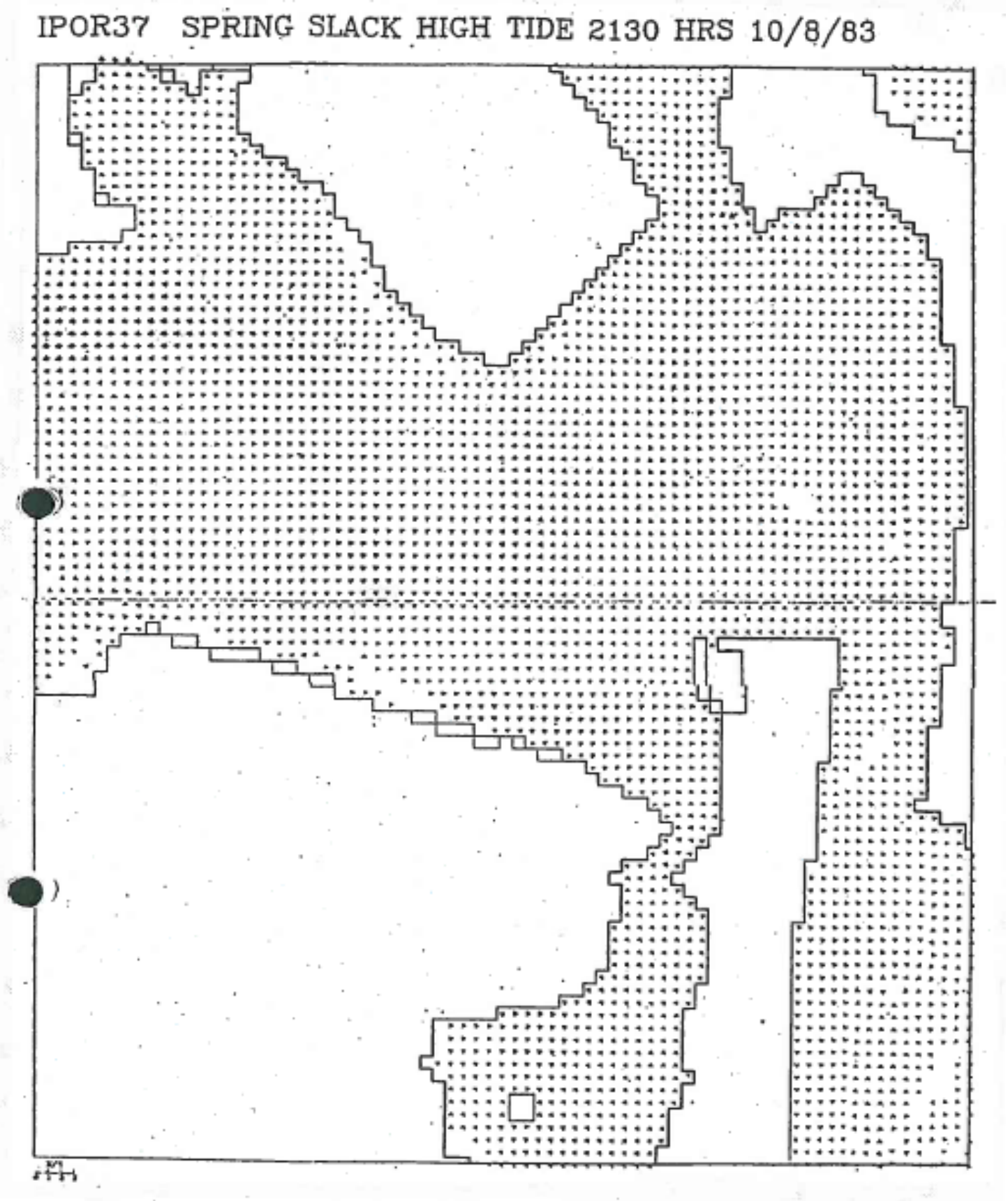
GENERALLY EASTWARD
SETTING CURRENT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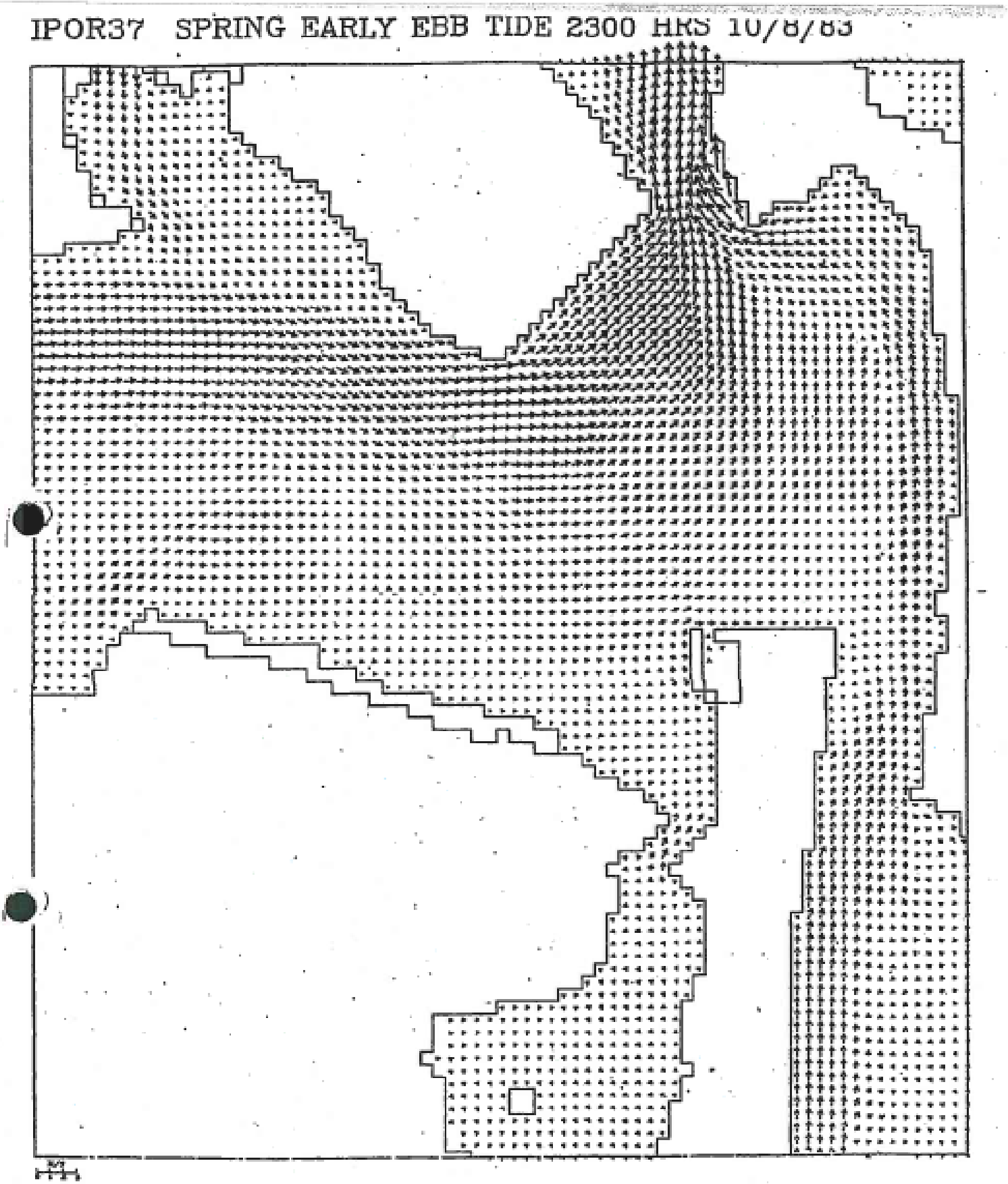
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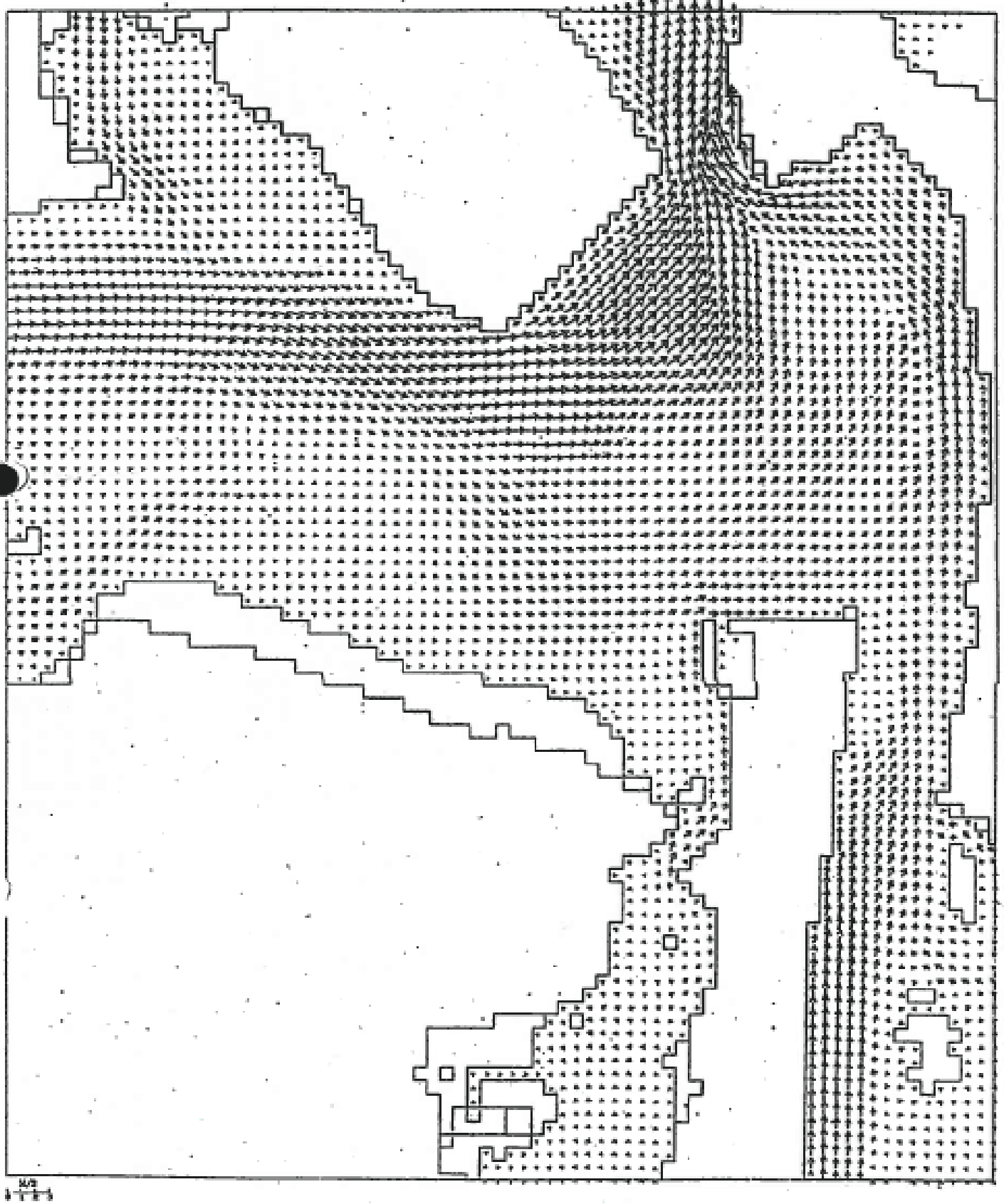

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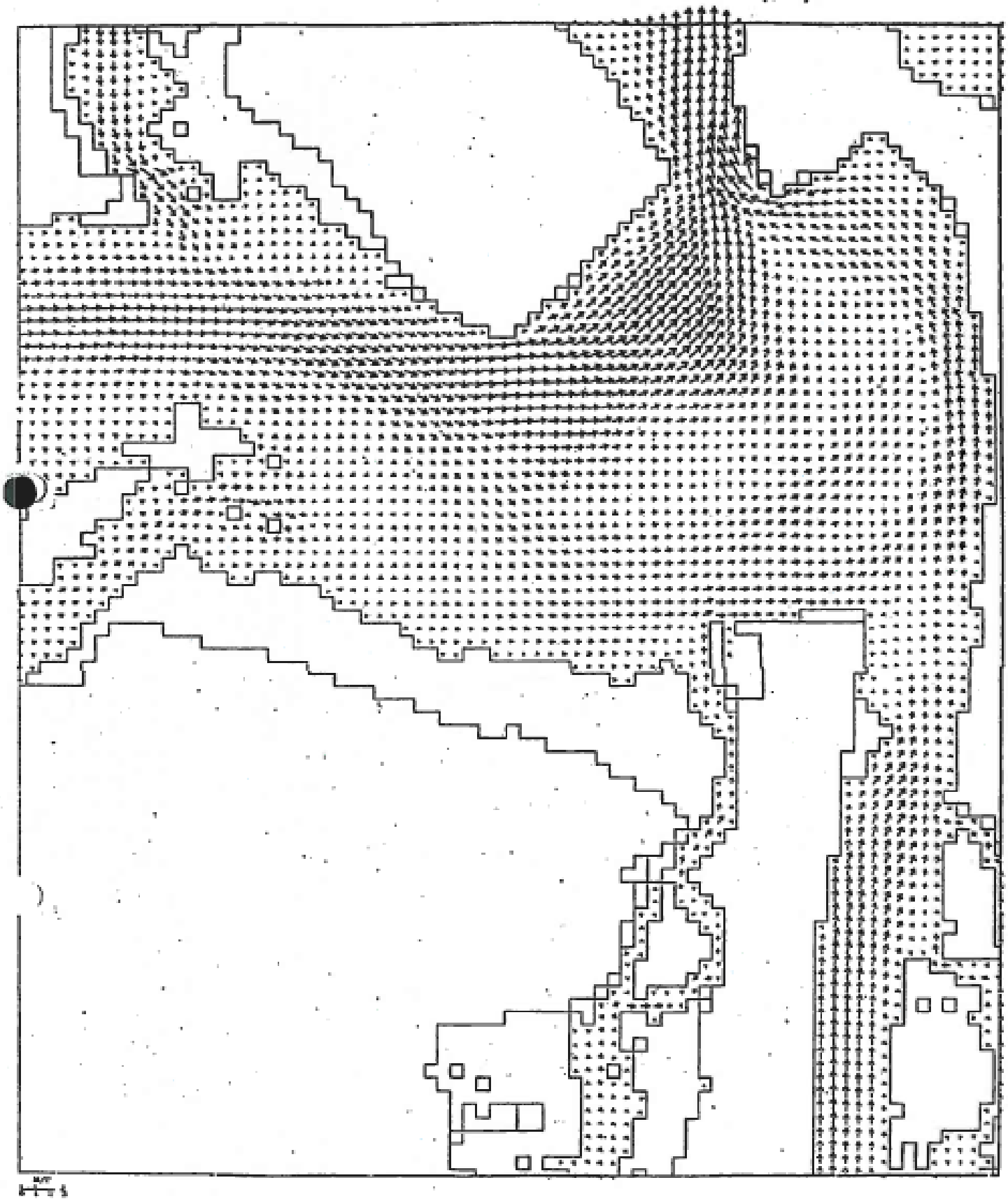

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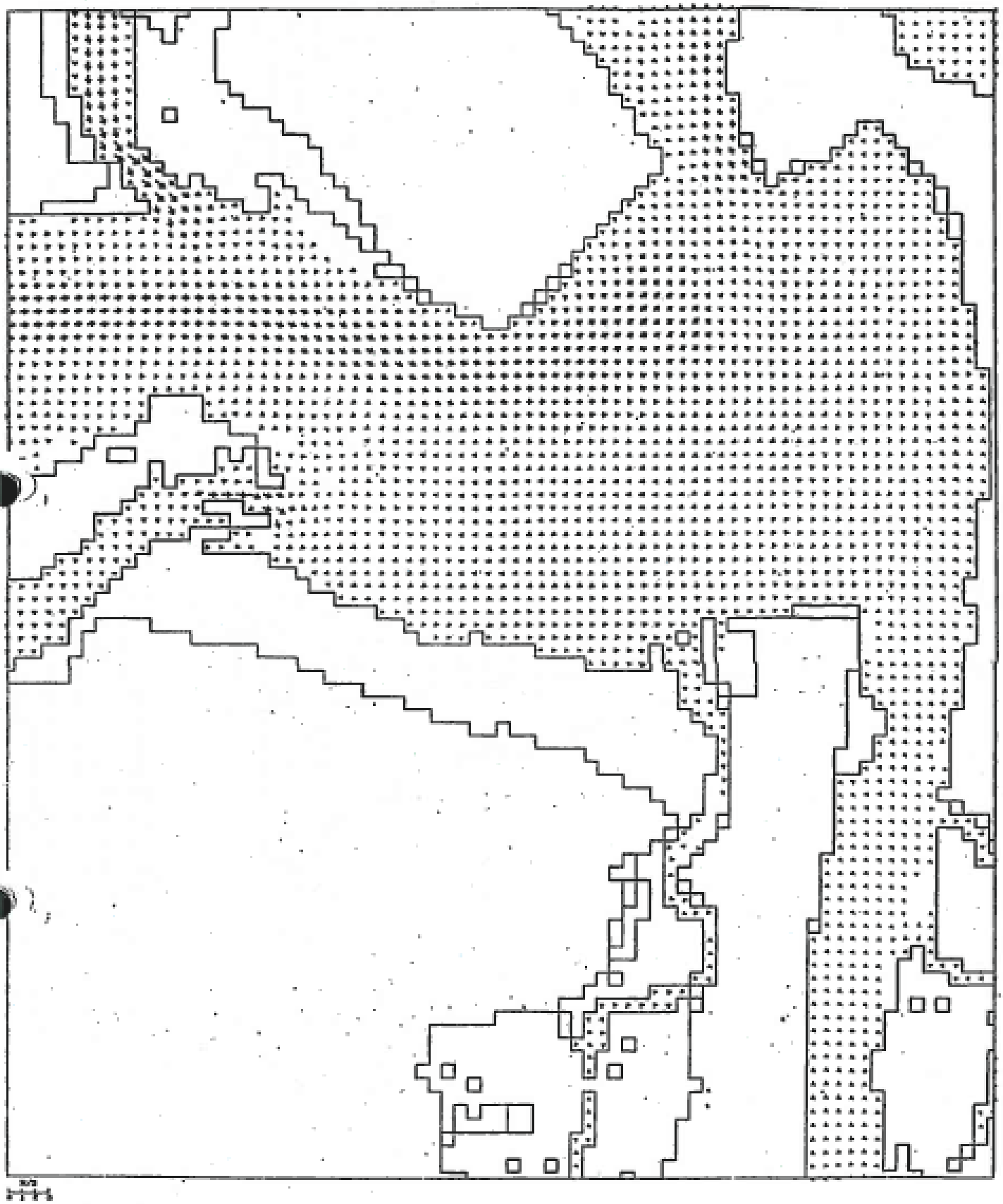

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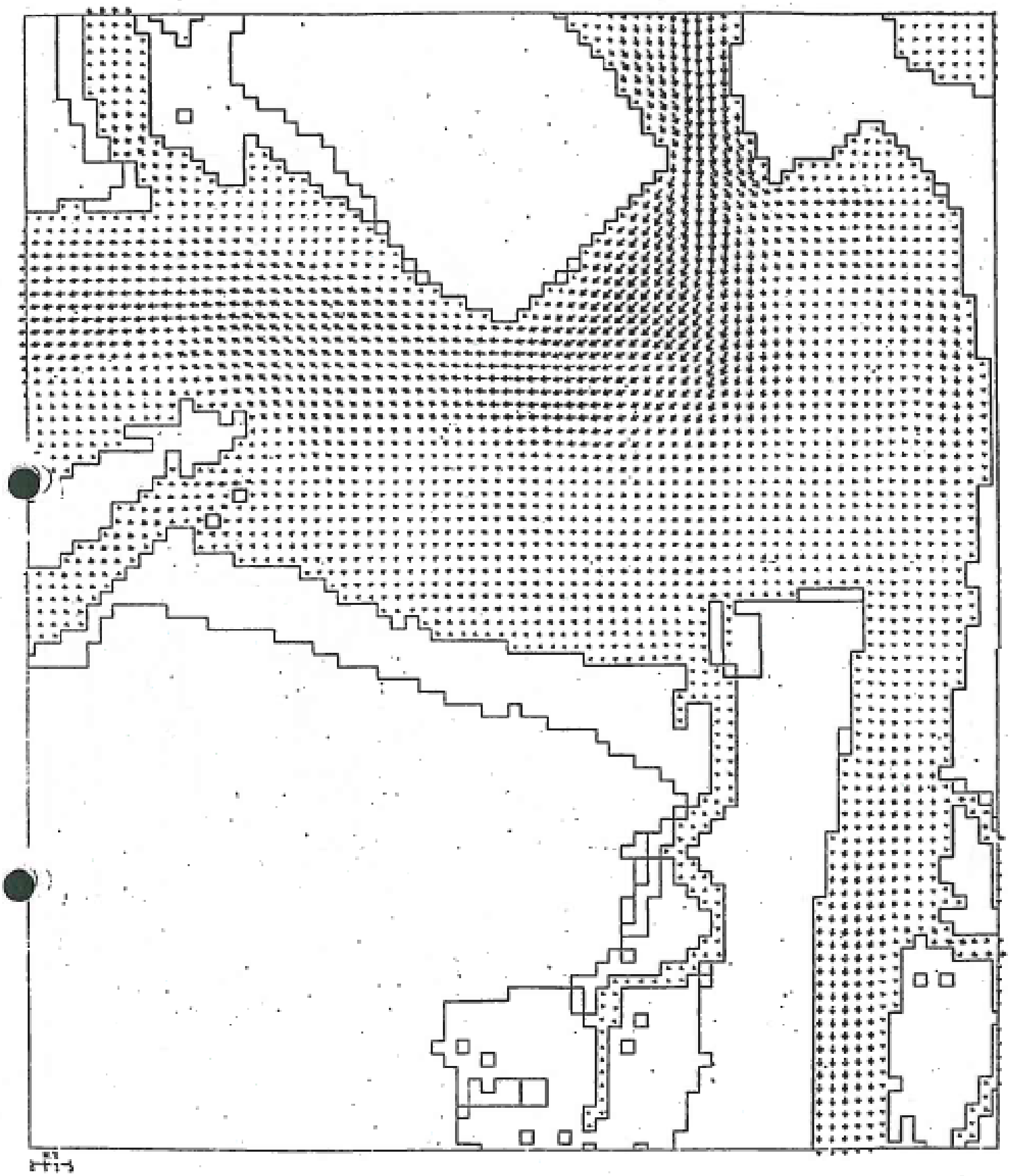

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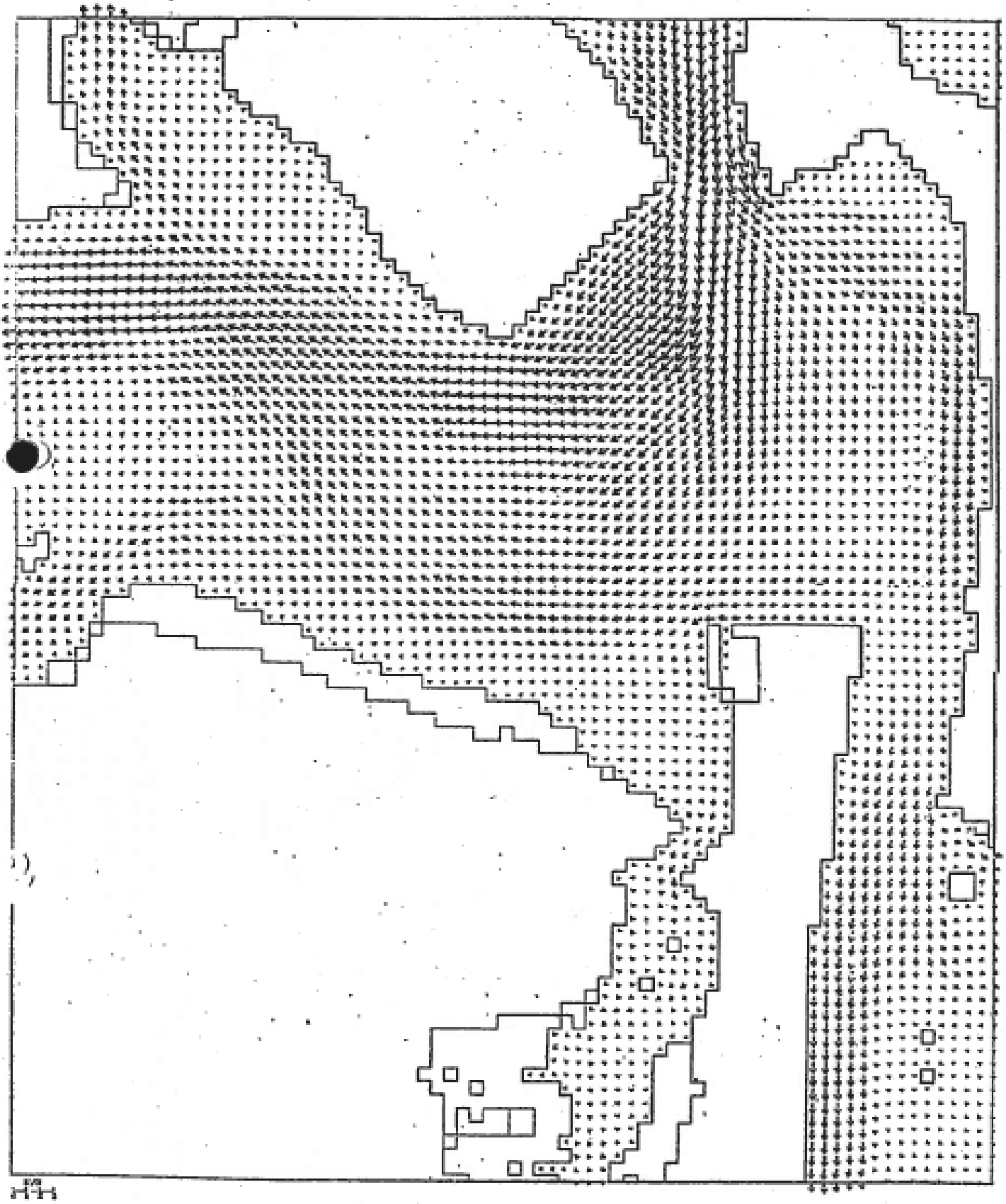

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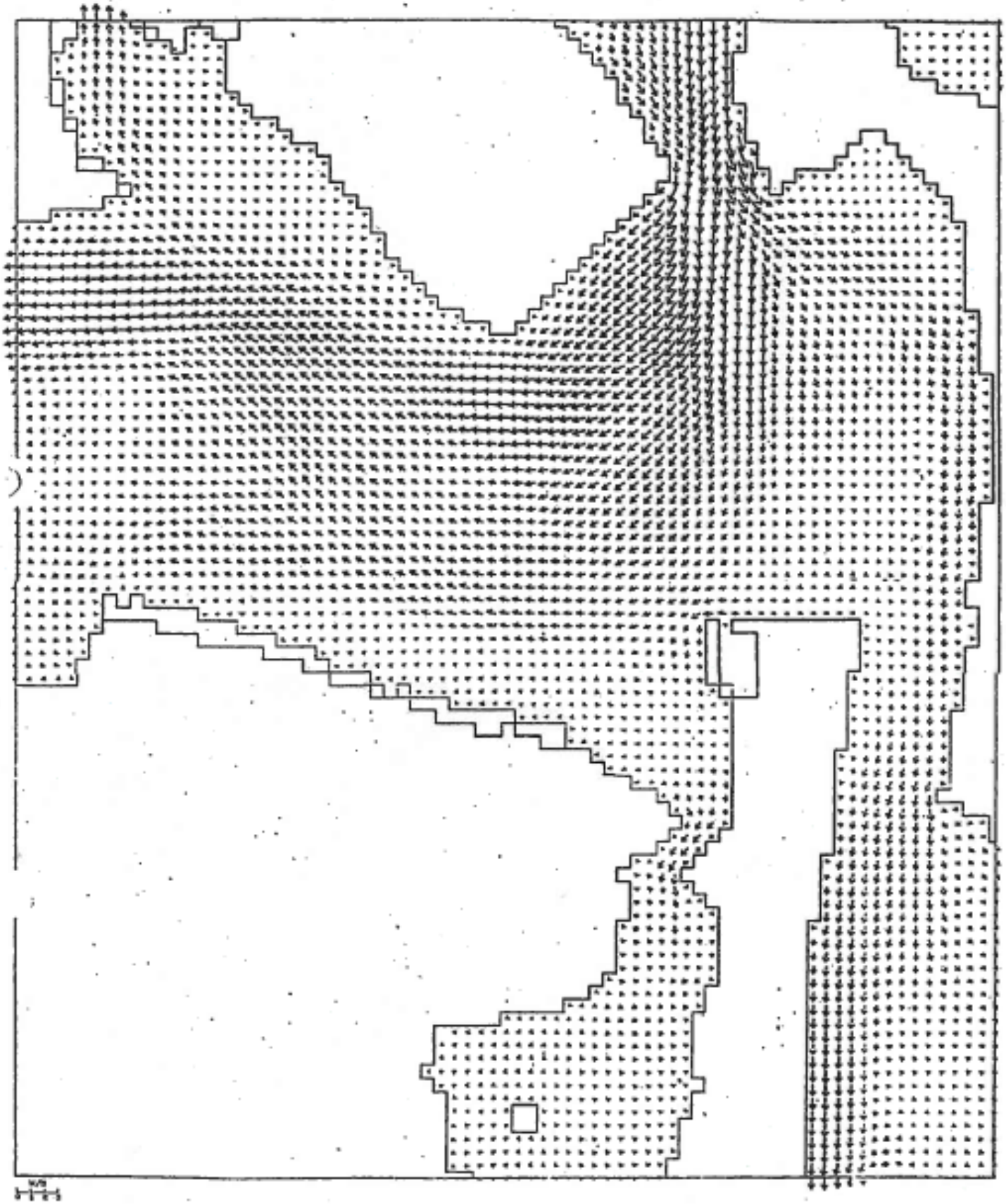
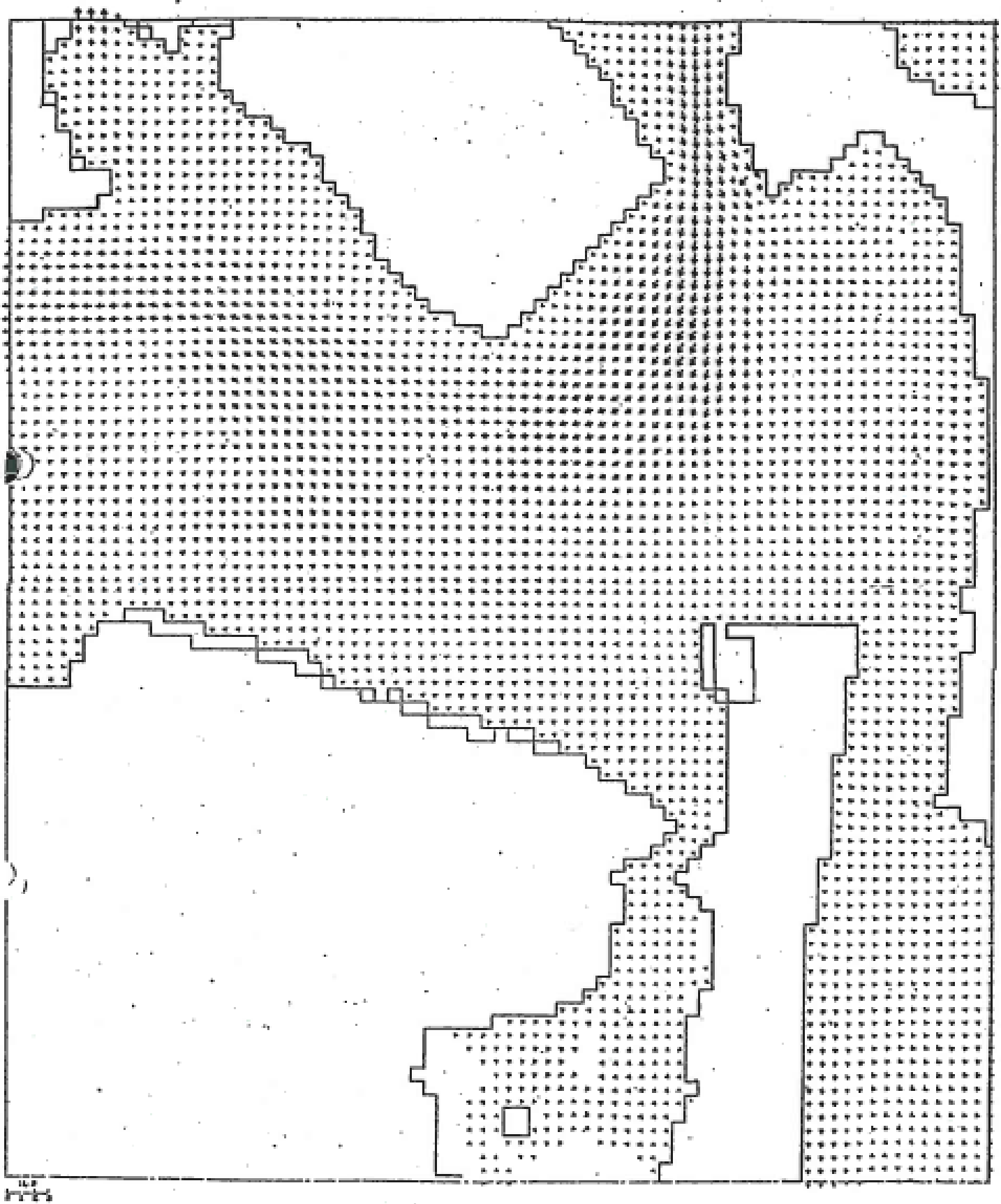
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