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Tide Stream Atlas—
Gulf of Carpentaria

A. M. G. Forbes

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TIDE STREAM ATLAS — GULF OF CARPENTARIA

A.M.G. Forbes

Division of Oceanography, CSIRO Marine Laboratories
P.O. Box 21, Cronulla, NSW 2230

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Abstract

This atlas allows mariners to predict the strength and direction of tidal currents throughout the Gulf of Carpentaria at all stages of the tidal cycle.

INTRODUCTION

This atlas is designed to aid mariners in estimating current strength and direction at points every 15 nautical miles in the Gulf of Carpentaria. It is based on a computer model of the tides in the Gulf (Church and Forbes 1981) verified by tide height observations at 10 locations around the Gulf, and by current meter measurements at three locations. The currents shown in this atlas are purely tidal since these dominate the circulation. However, wind driven currents may significantly modify them for short periods. The diagrams are for spring tides. For neaps, and periods between, current speed should be reduced by up to 50% according to the scale illustrated in Fig. 1.

Each diagram includes tidal height contours and tidal currents, and is separated by 1½ hours from the next diagram. The contours of tide height are in metres above mean sea level. Equal positive heights are contoured with a solid line, and equal negative heights with a dashed line.

Currents are represented by arrows whose lengths are proportional to current speed. In the bottom right hand corner of each diagram is a speed scale in metres per second and in knots, together with an arrow indicating the maximum current found on that diagram.

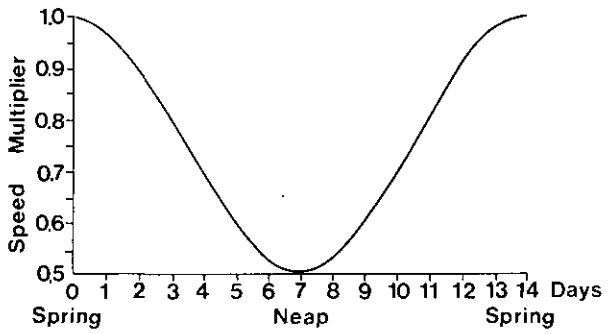


Fig. 1. Factor by which diagram speed must be multiplied to allow for smaller currents at neap tides.

INSTRUCTIONS FOR USE

1. From published tide tables, determine the time of high or low water at the coastal location closest to your position.

2. Find the tide stream diagram which shows the highest (solid line) or lowest (dashed line) contour at your position. This diagram represents high or low tide at your position and shows the tidal currents for that tide.

3. Note the diagram time, then progress forward or backward in the sequence of diagrams, in 1½ hour steps, to the time of interest, if different from the time of high or low water. Using a pair of dividers and the scale in the top left hand corner, determine current speed from the current arrow nearest your location.

4. Using the tide tables again, determine the number of days from the date of interest to the nearest spring tide and, using Fig. 1, multiply the current speed by the appropriate multiplier.

5. The diagram selected shows the tidal currents for the whole of the Gulf, as well as for your location at the time of interest.

6. If, by progressing forwards in 1½ hour steps, the last diagram (No. 16) is reached, the next diagram in sequence is the first diagram (No. 1).

EXAMPLE

What tidal currents could be expected for a boat leaving Karumba at 2100 hours on 20 March 1981, heading 315° (true) for the next 6 hours at 10 knots?

1. High water is at 19:28 hours on 20 March 1981 (Australian National Tide Tables).

2. At Karumba, maximum high water contour of 2.0 metres (above mean sea level) occurs in diagram 9, at time 12.

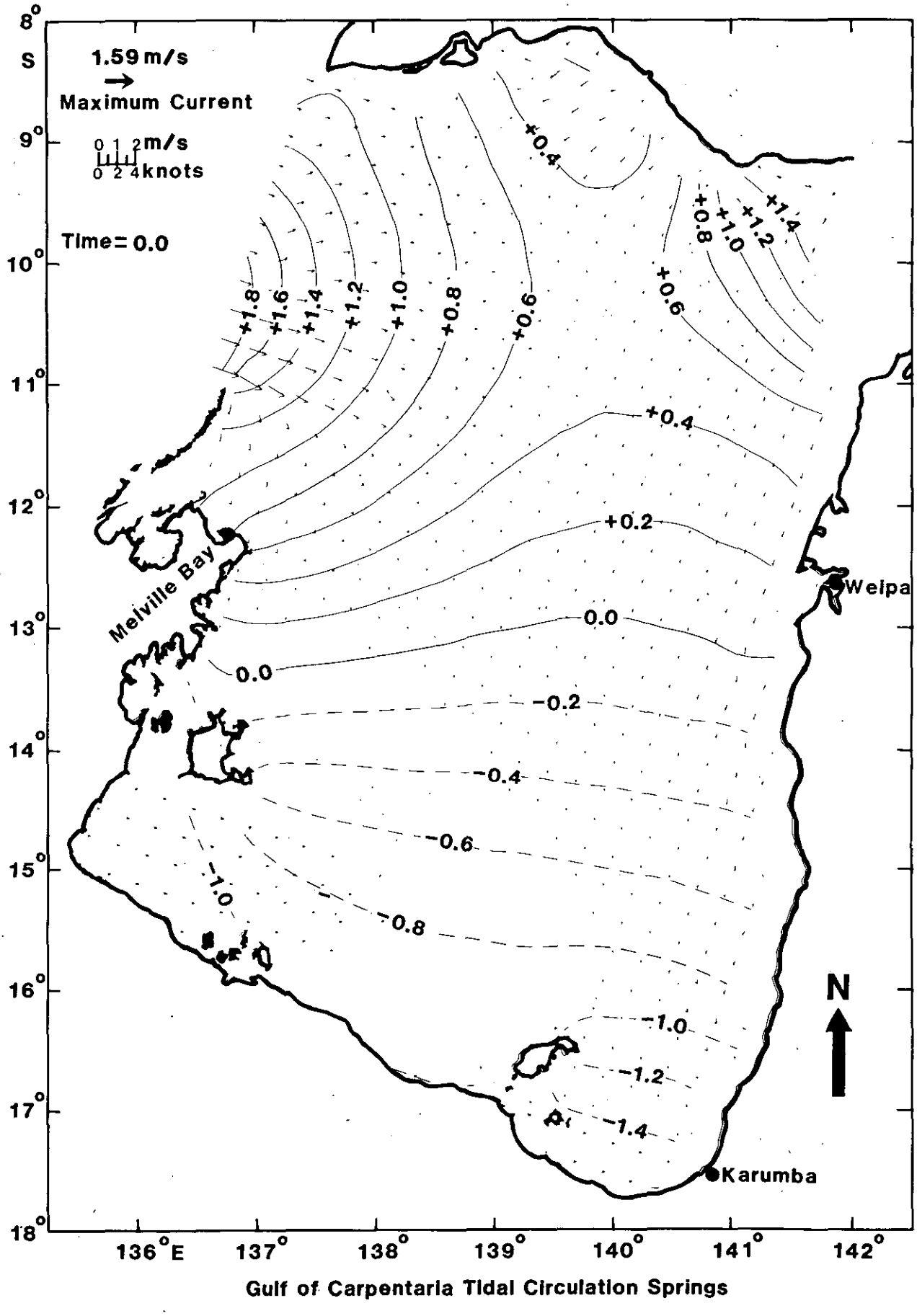
3. The time of interest, 2100 hours, is $1\frac{1}{2}$ hours after high tide so we start with diagram 10 at time 13.5.

4. March 16 is the nearest spring tide (2.8 m), so from Fig. 1, the speed multiplier for March 20, 4 days later, is 0.7.

		Diagram					Current	
Time	Date	Number	Time	Your Location	Diagram speed	Speed multiplier	Speed (kt)	Direction (true)
2100	20.3	10	13.5	Off Karumba	0.1	0.7	0.1	270°
2230	20.3	11	15	15 n miles offshore	0.5	0.7	0.4	355°
0000	21.3	12	16.5	30 n miles offshore	0.7	0.7	0.5	000°
0130	21.3	13	18	45 n miles offshore	1.0	0.7	0.7	025°
0300	21.3	14	19.5	60 n miles offshore	0.9	0.7	0.6	005°

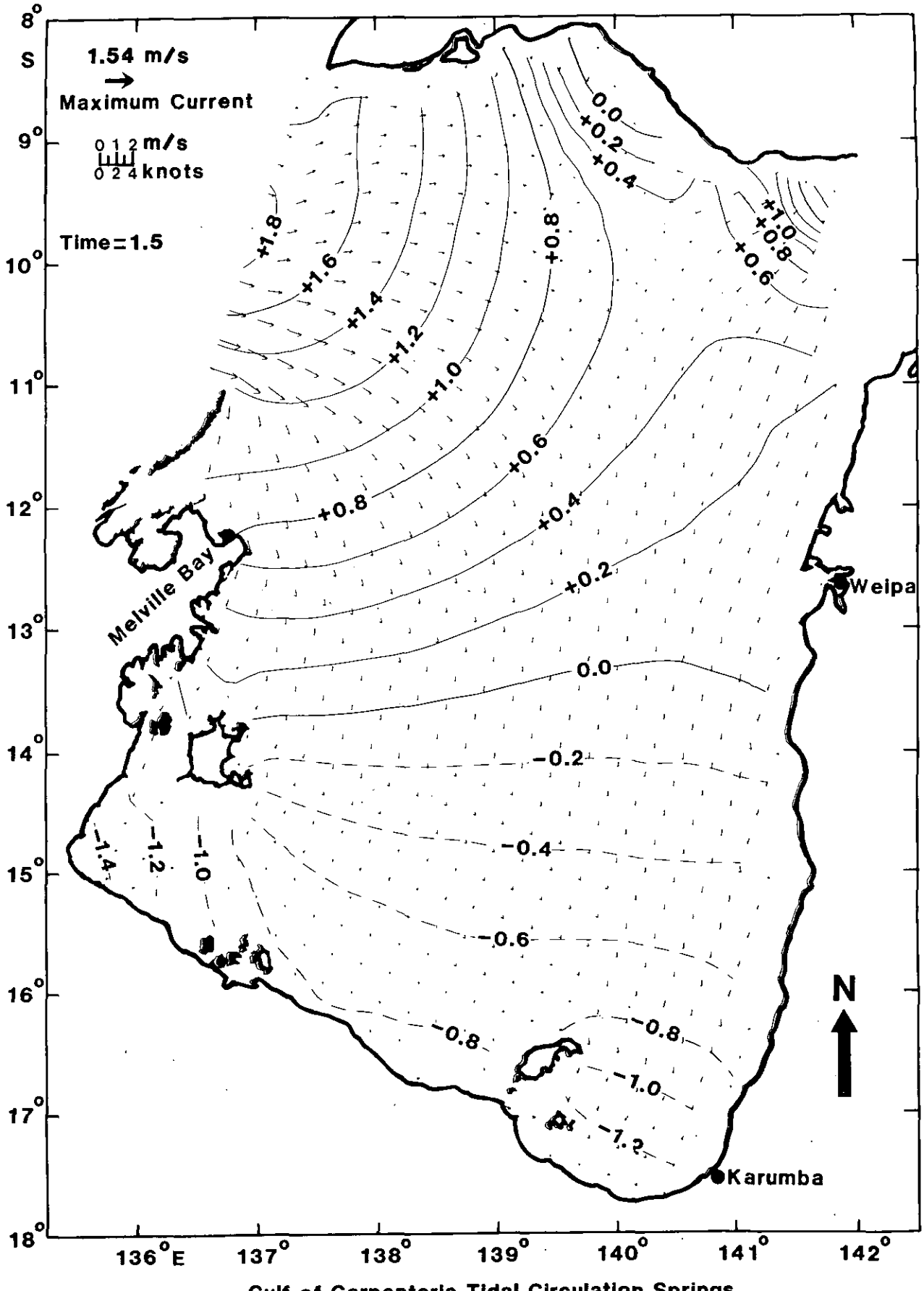
REFERENCE

Church, J.A., and Forbes, A.M.G. (1981). Non-linear model of the diurnal and semi-diurnal tides in the Gulf of Carpentaria. *Aust. J. Mar. Freshwater Res.* 32.



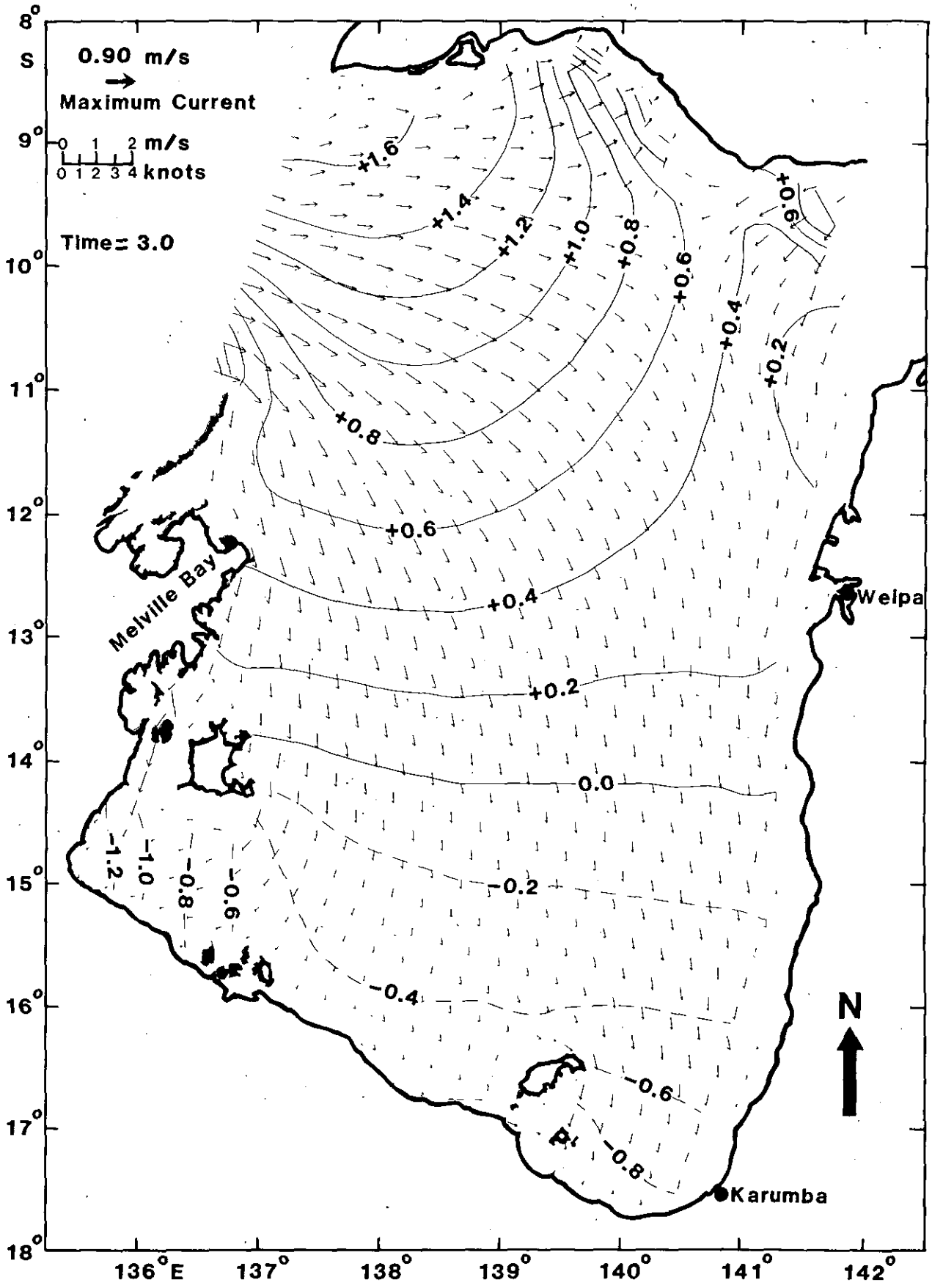
Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 1. Time = 0.0 hours



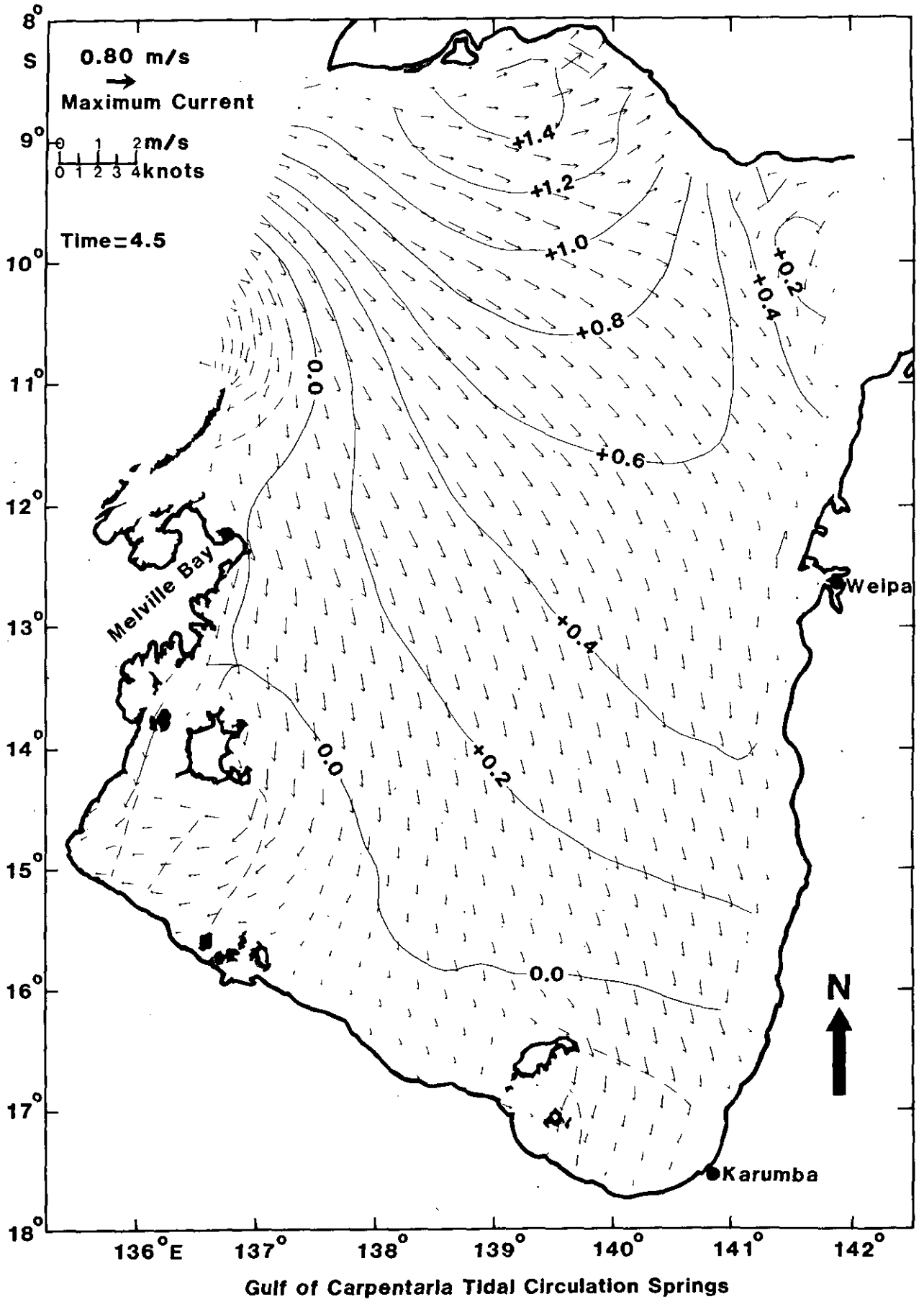
Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 2. Time = 1.5 hours



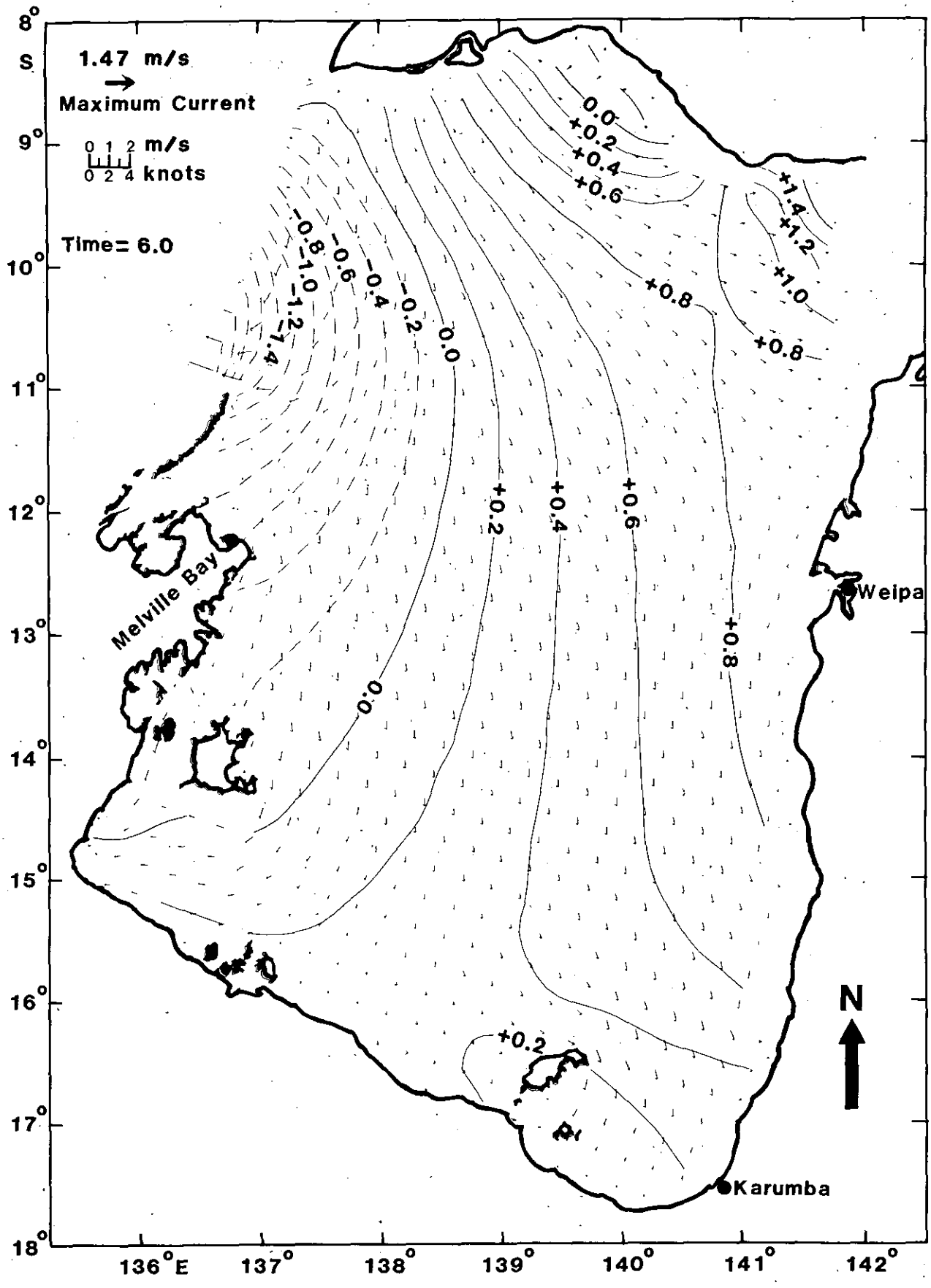
Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 3. Time = 3.0 hours



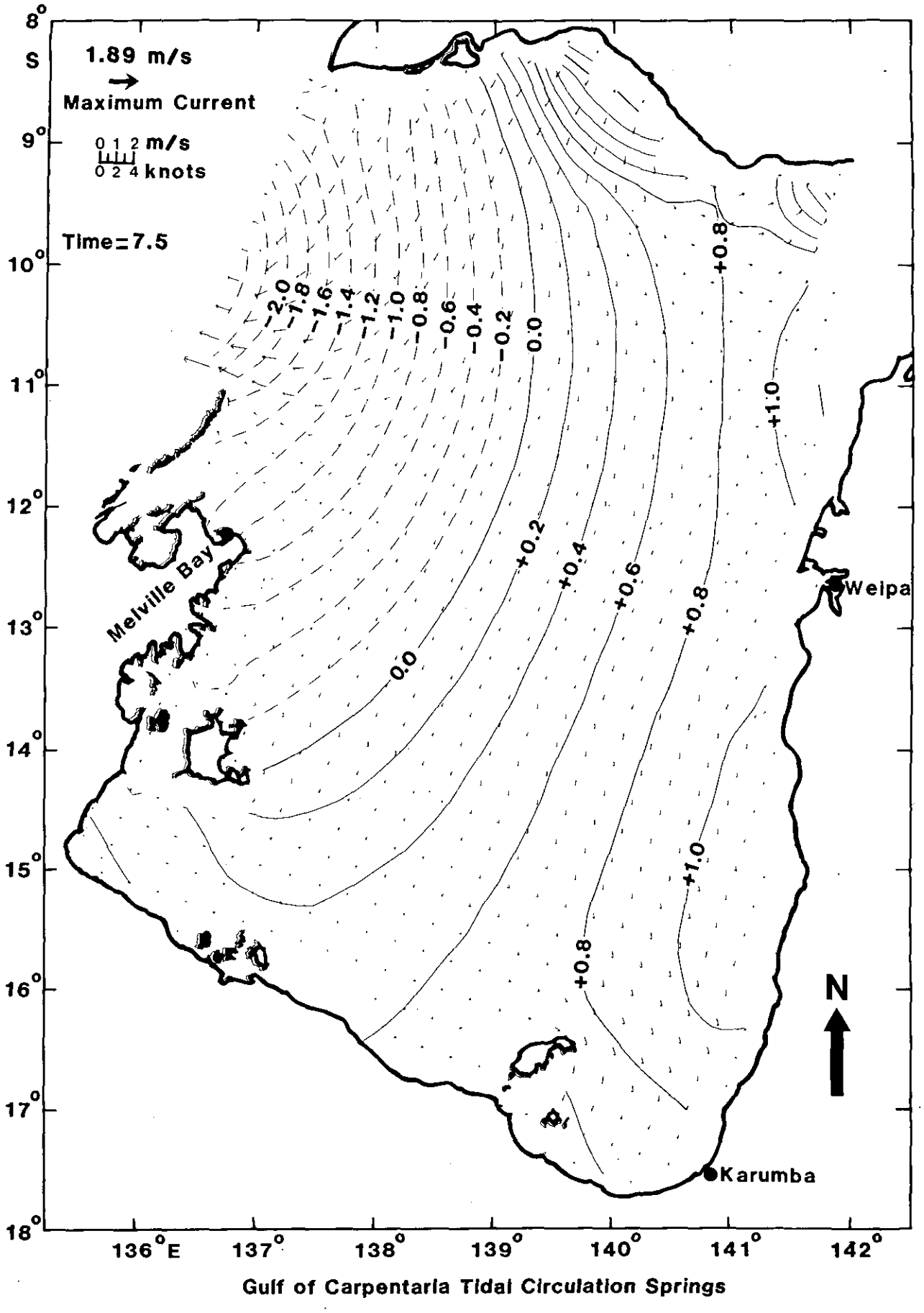
Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 4. Time = 4.5 hours



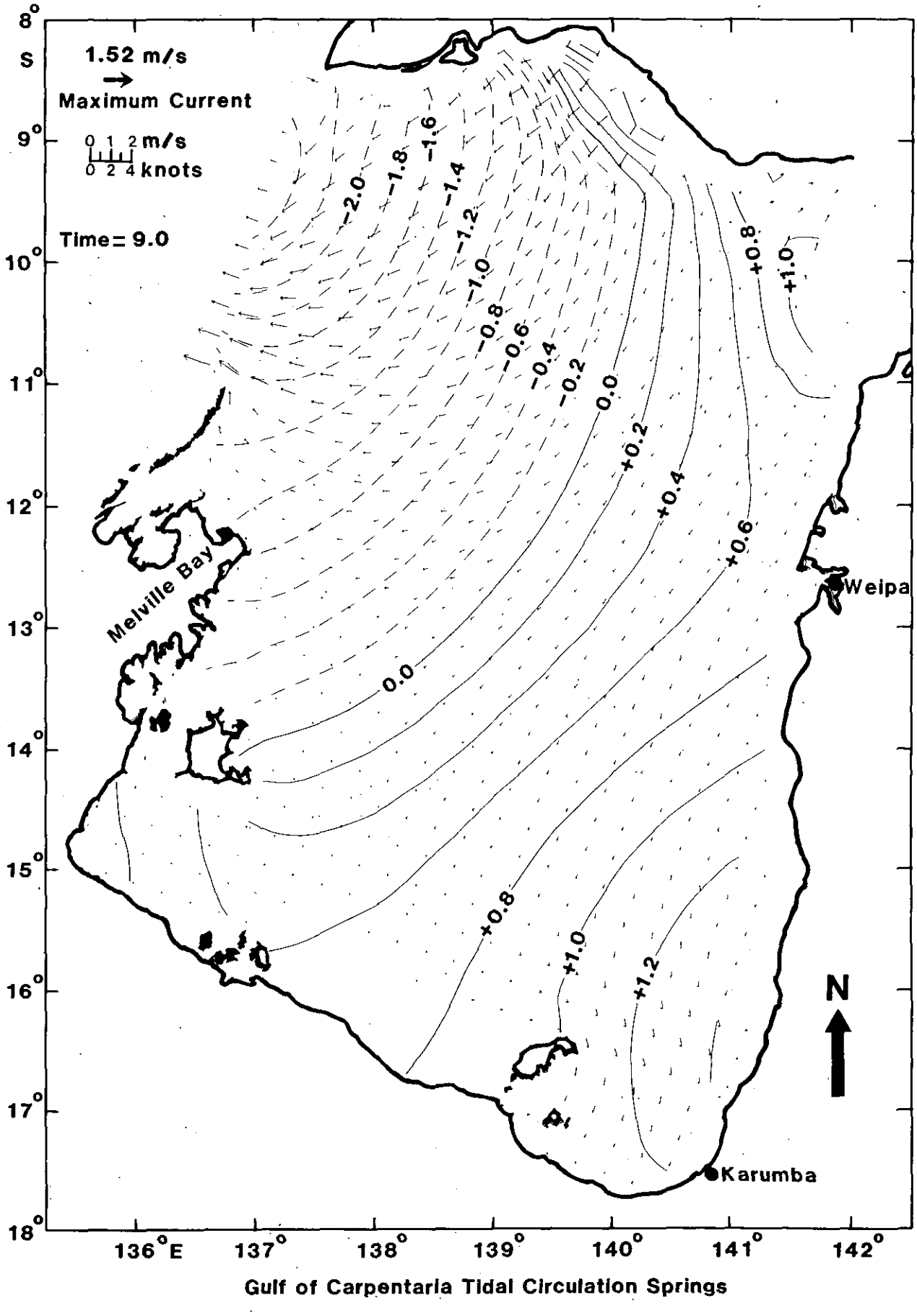
Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 5. Time = 6.0 hours



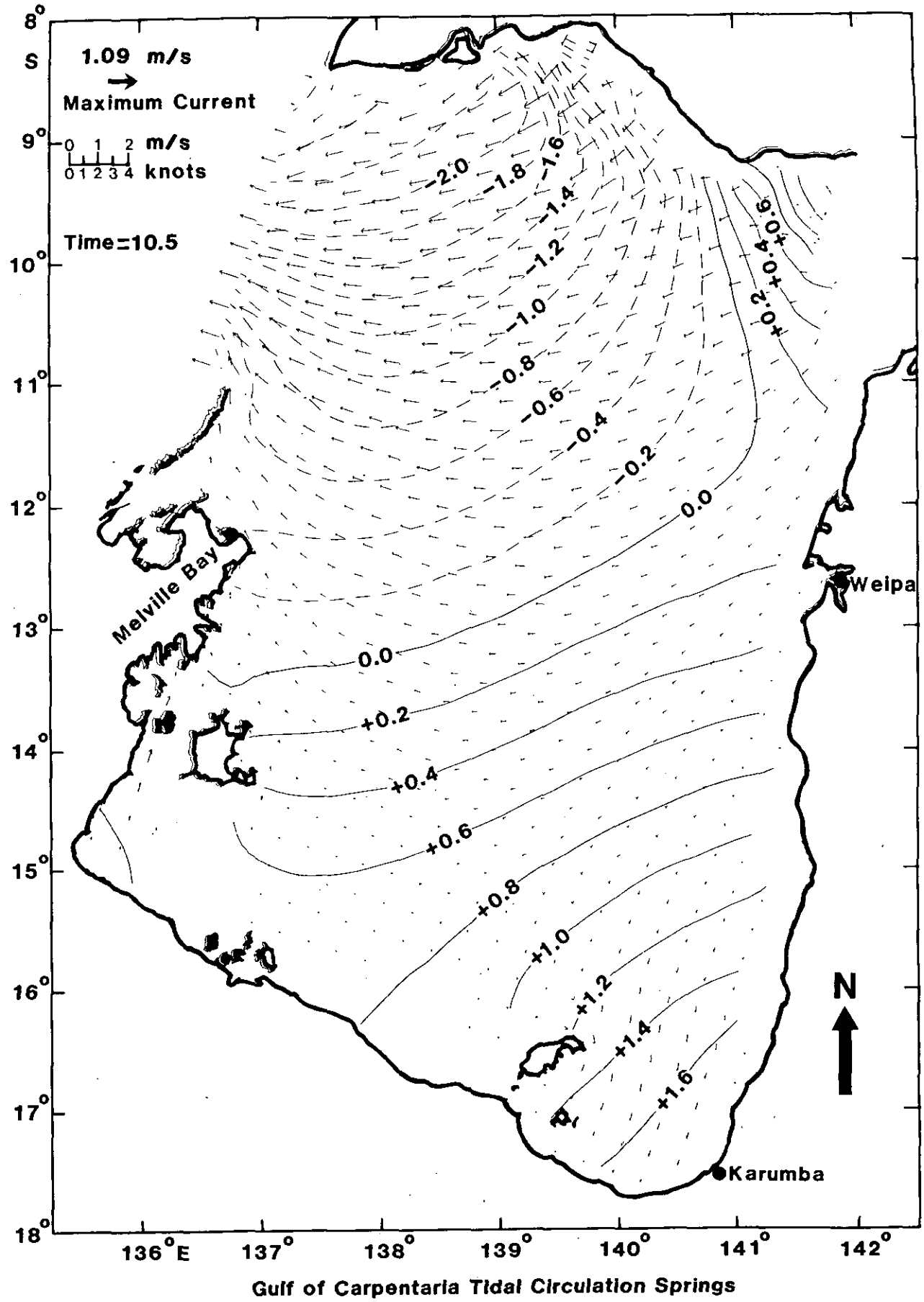
Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 6. Time = 7.5 hours



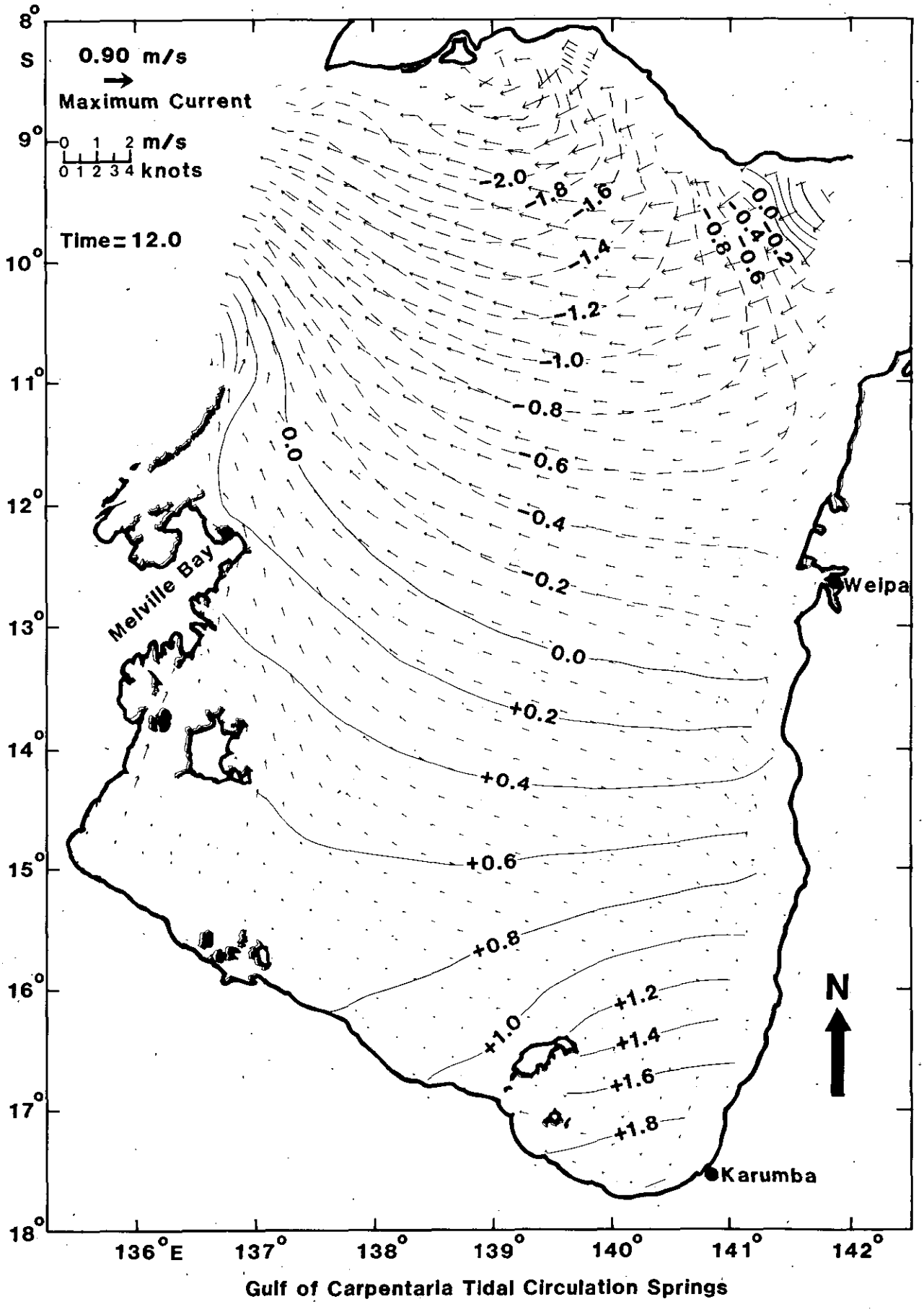
Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 7. Time = 9.0 hours



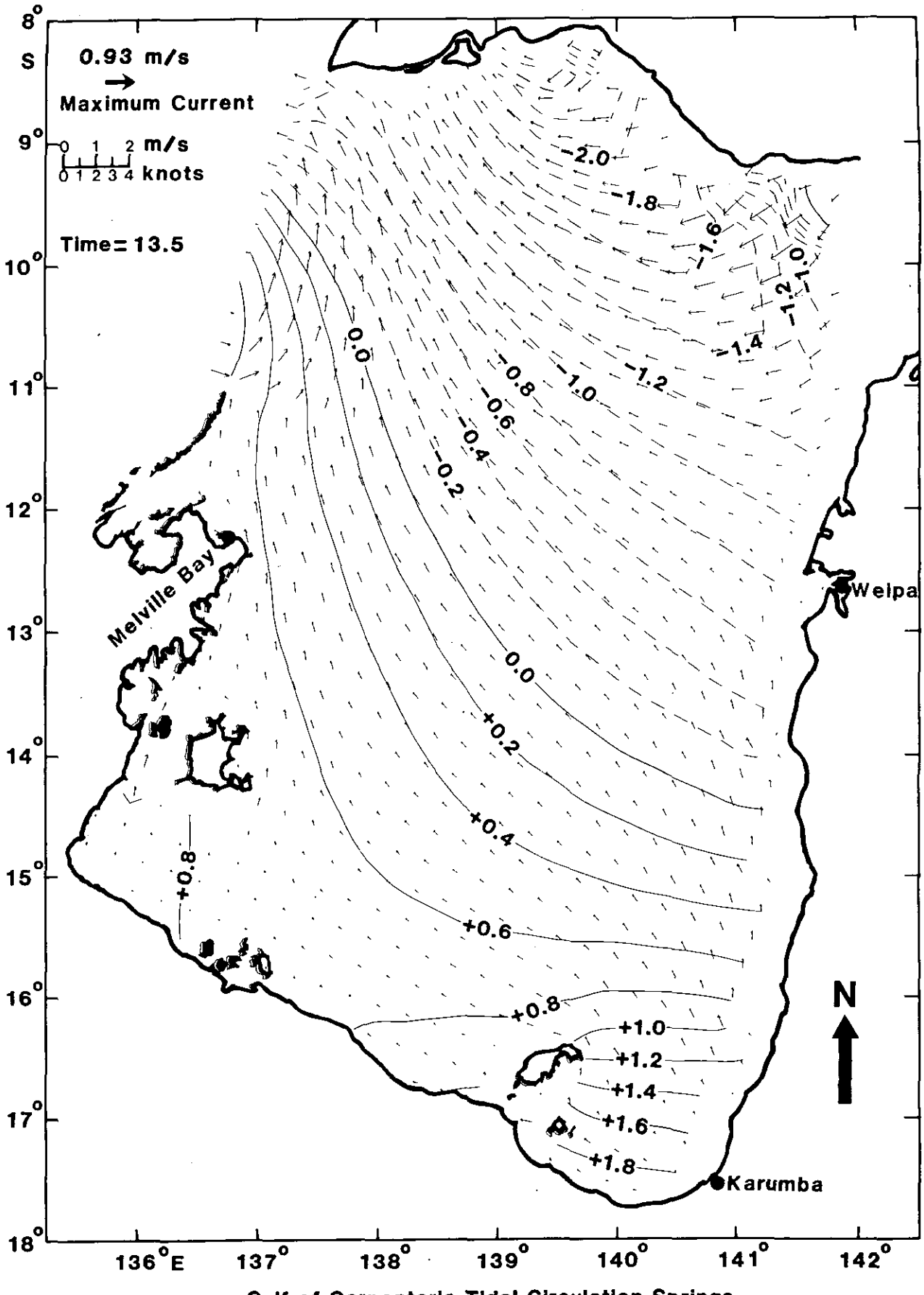
Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 8. Time = 10.5 hours



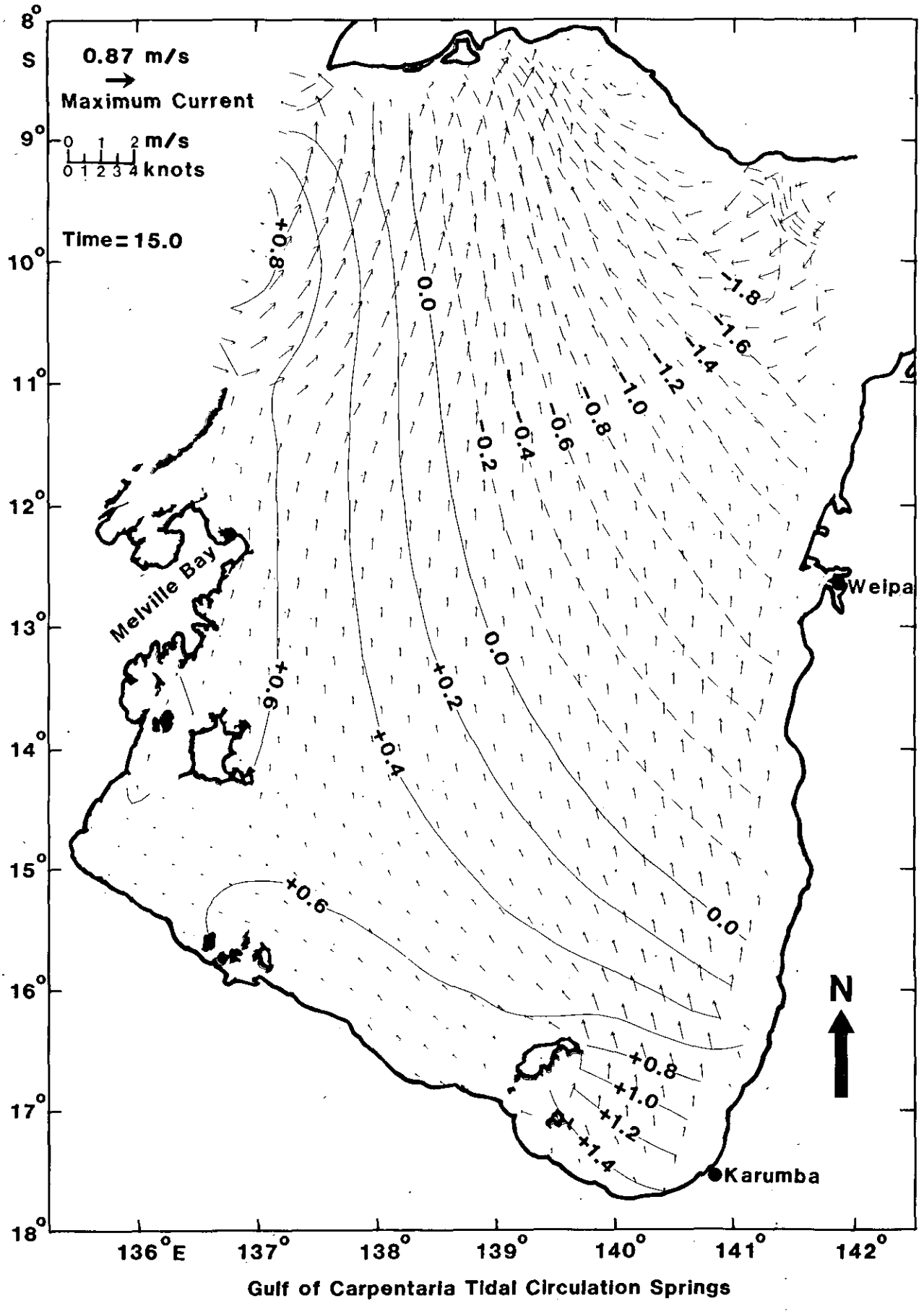
Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 9. Time = 12.0 hours



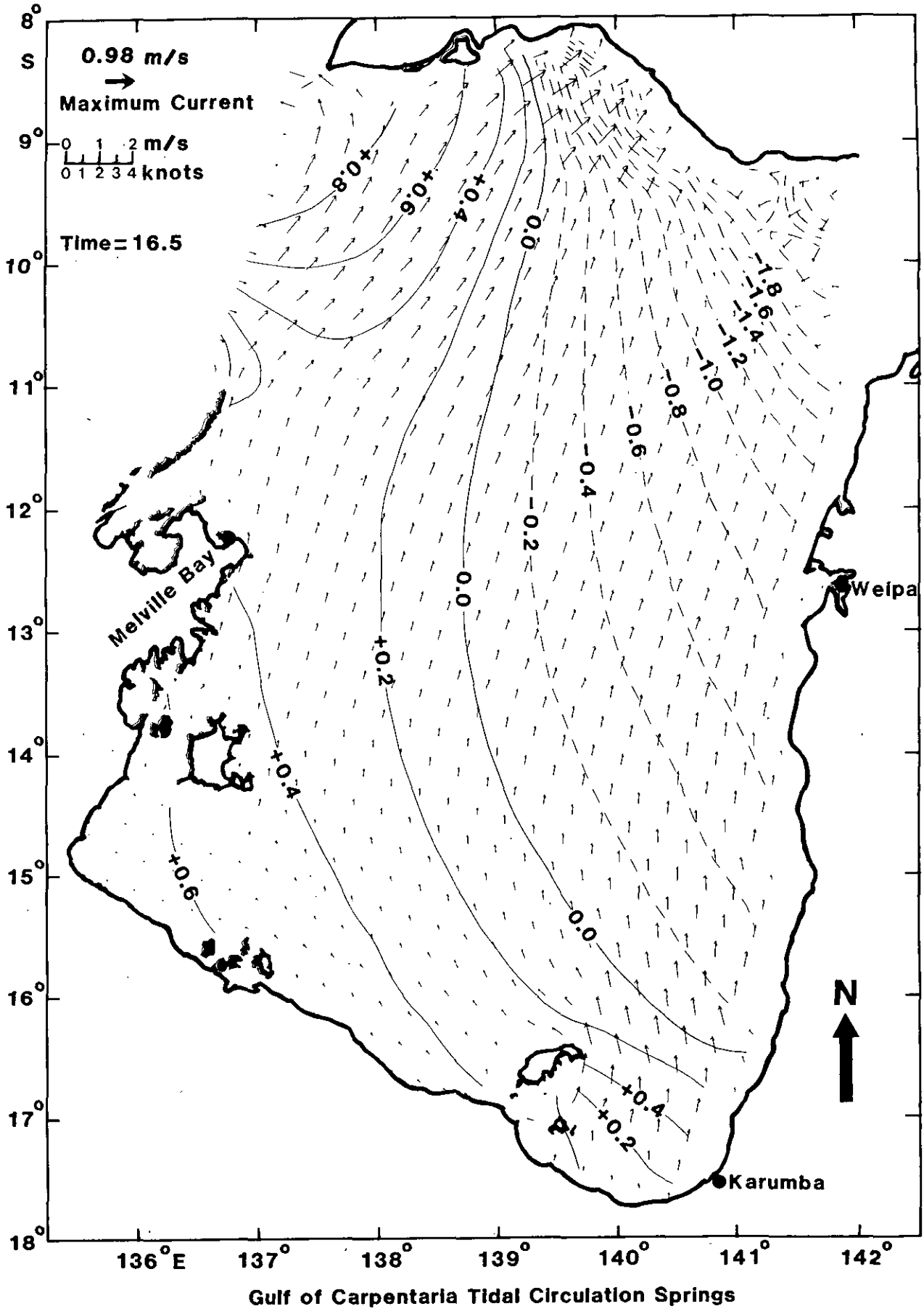
Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 10. Time = 13.5 hours



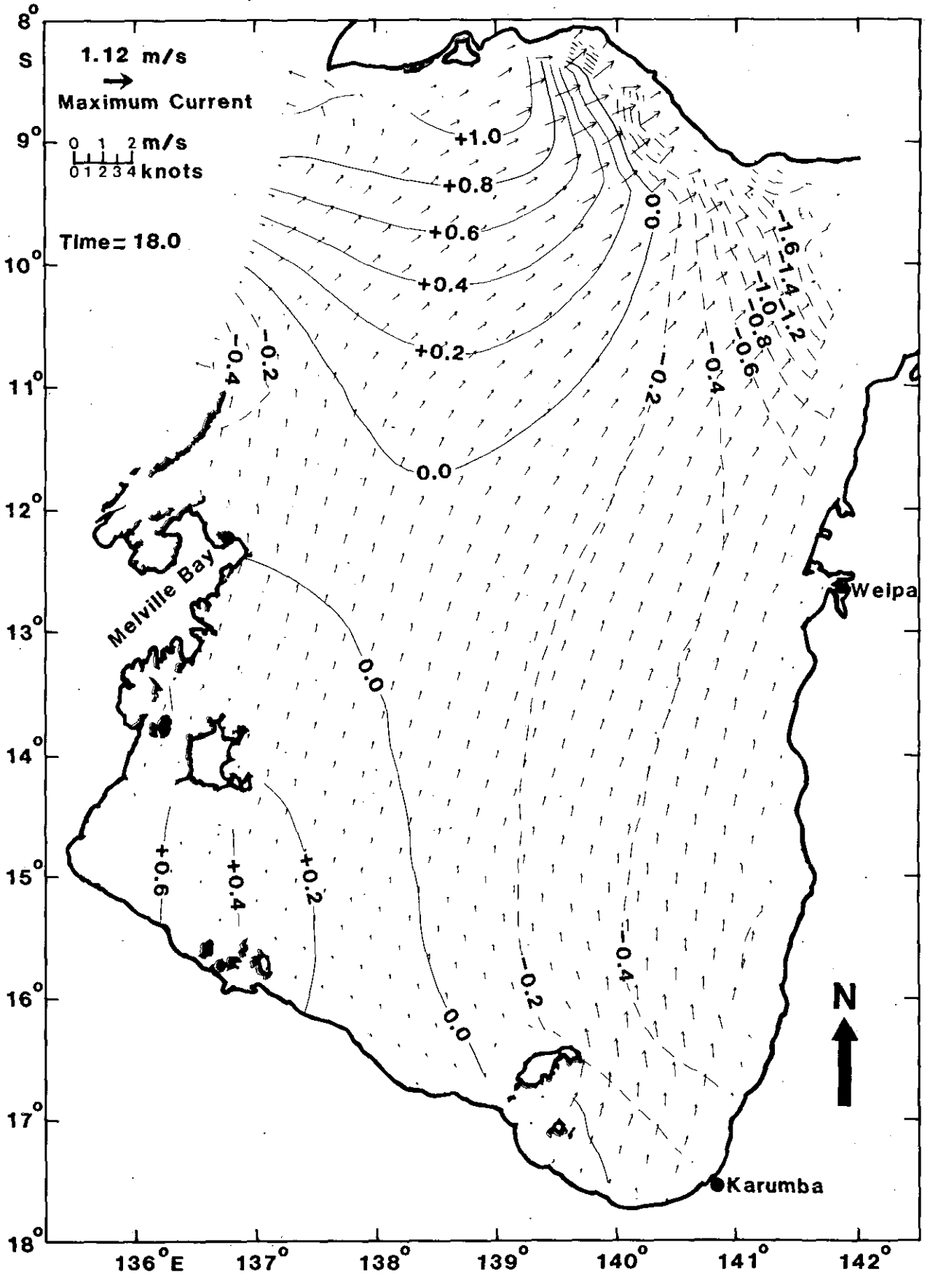
Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 11. Time = 15.0 hours



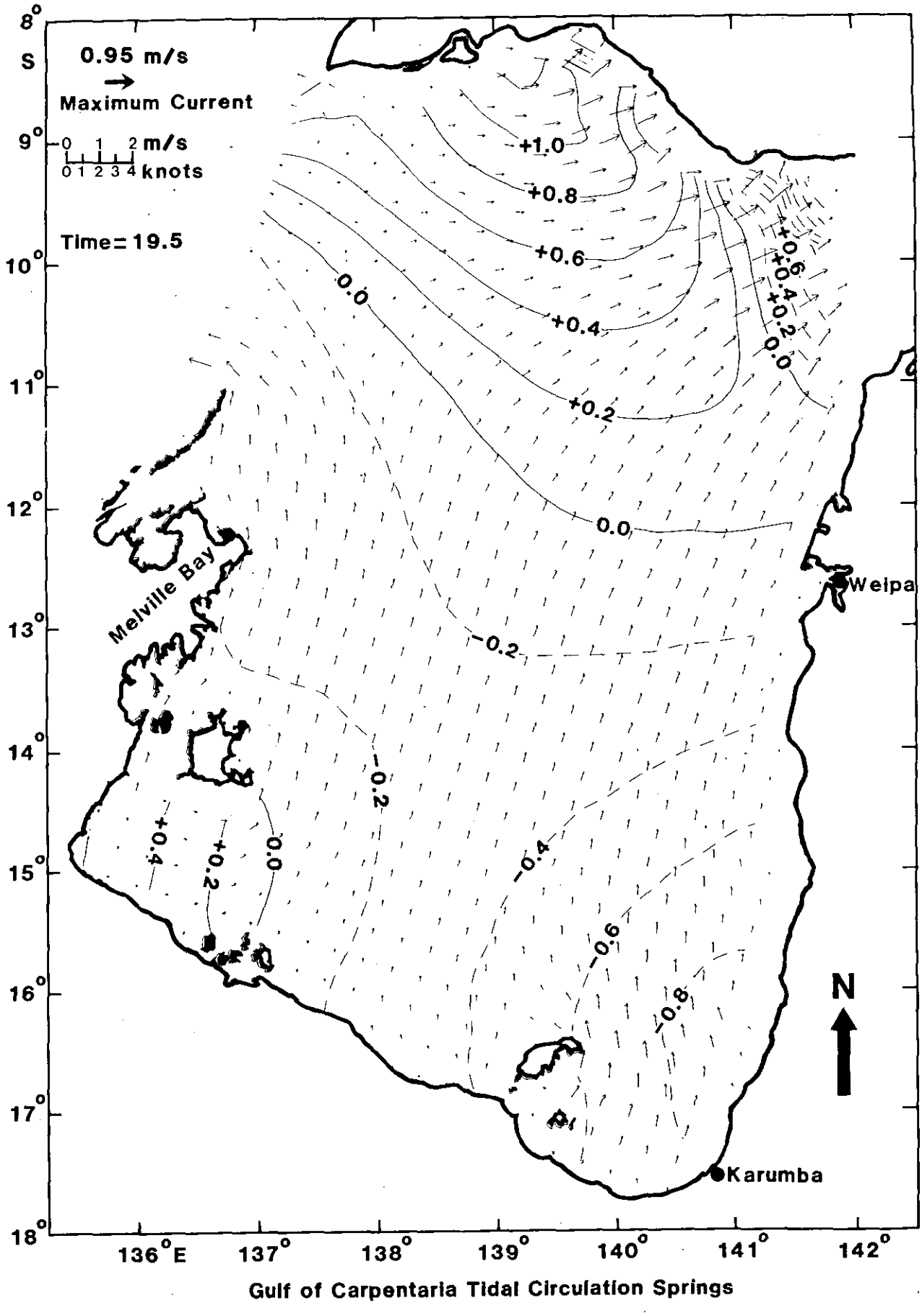
Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 12. Time = 16.5 hours



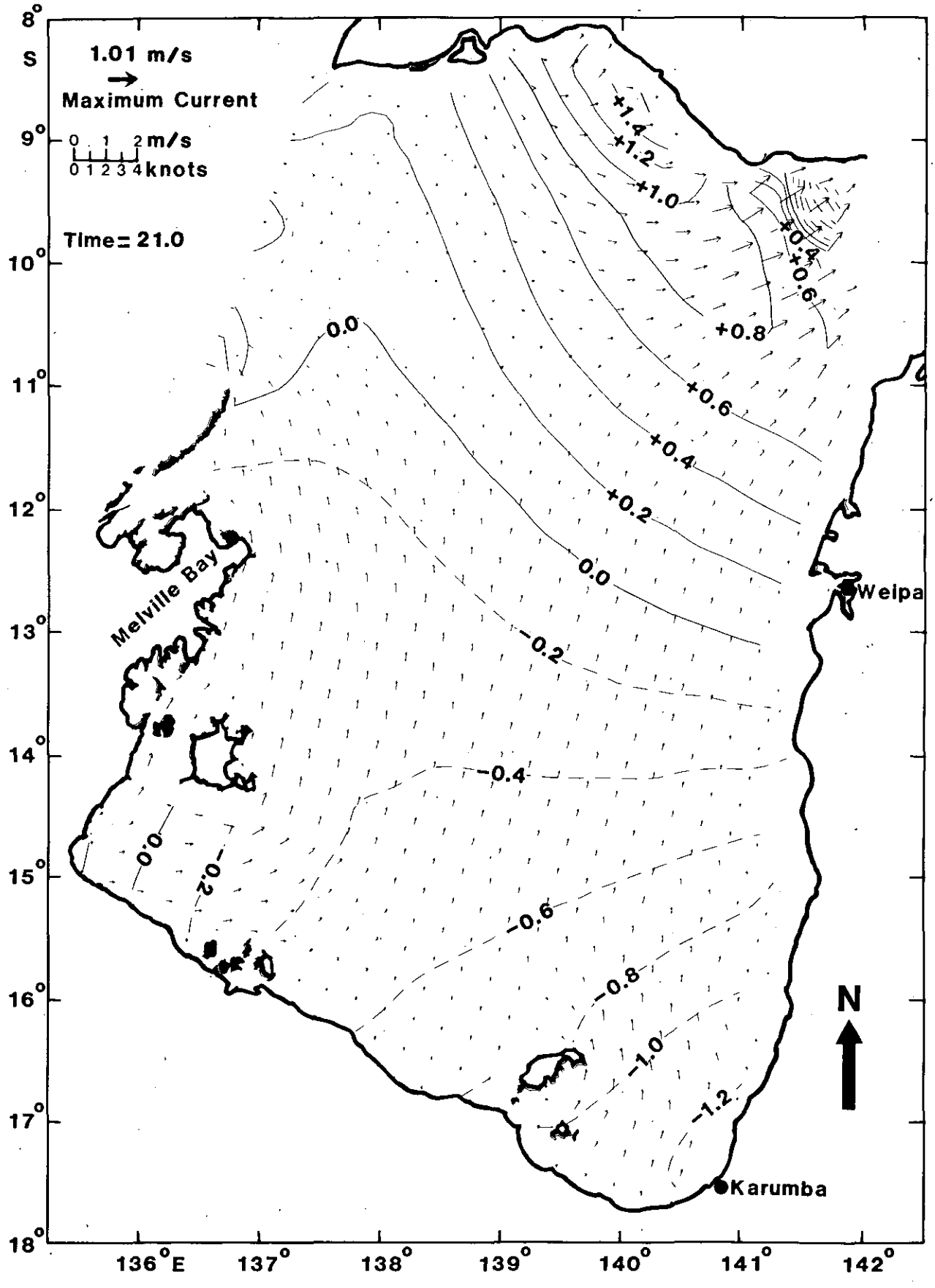
Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 13. Time = 18.0 hours



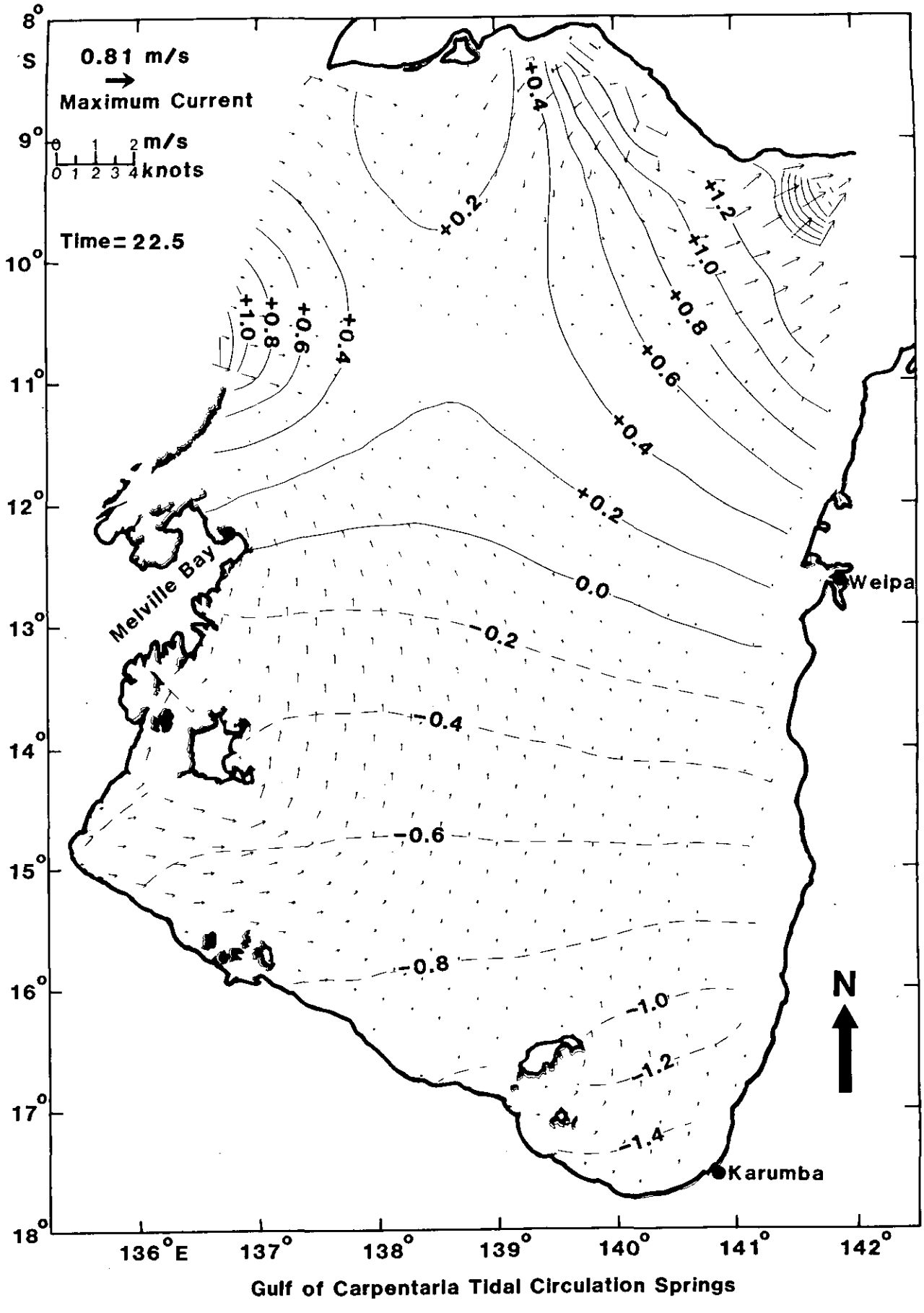
Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 14. Time = 19.5 hours



Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 15. Time = 21.0 hours



Gulf of Carpentaria Tidal Circulation Springs

Tide stream Diagram No. 16. Time = 22.5 hours

CSIRO
Marine Laboratories
comprises

Division of Fisheries Research
Division of Oceanography
Central Services Group

HEADQUARTERS
202 Nicholson Parade, Cronulla, NSW
P.O. Box 21, Cronulla, NSW 2230, Australia

QUEENSLAND LABORATORY
233 Middle Street, Cleveland, Qld
P.O. Box 120, Cleveland, Qld 4163

WESTERN AUSTRALIAN LABORATORY
Leach Street, Marmion, WA
P.O. Box 20, North Beach, WA 6020