

FRANKLIN

National Facility
Oceanographic Research Vessel

Continuity of the Subtropical Front and its Seasonal Variation
South of Australia

CRUISE SUMMARY

ORV FRANKLIN

FR 02/98

Depart Port Adelaide
Arrive Hobart

Friday 30 January 1998
Tuesday 17 February 1998

Principal Investigator

Professor Matthias Tomczak
FIAMS, The Flinders University of S.A.

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CRUISE SUMMARY

R/V FRANKLIN

FR 02/98

Continuity of the Subtropical Front and its seasonal variation south of Australia

Departed Port Adelaide 1300 h Friday 30 January 1998

Arrived Hobart 1500 h Tuesday 17 February 1998

Principal Investigator

Prof. Matthias Tomczak, FIAMS, the Flinders University of S.A.

**R/V Franklin
Research Summary
Cruise FR02/98**

Itinerary

Sailed Port Adelaide 1300 h Friday 30 January 1998

Arrived Hobart 1500 h Tuesday 17 February 1998

Principal Investigator

Prof. Matthias Tomczak
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Cruise Objectives

Research voyage FR02/98 was the first of two research cruises to study seasonal variability of the position and intensity of the Subtropical Front south of Australia. Historical reports place the Subtropic Front south of Australia at latitudes south of 40°S and show it as a continuous feature. Observations during R/V Franklin cruise FR10/94 located the Subtropical Front in the vicinity of 40°S near 120°E (between Albany and Esperance) but very close to the Australian shelf, near 35°S, at 132°E (the Head of the Bight). Taken in combination with our historical understanding, this could suggest either large regional or seasonal variability of the Subtropical Front or the need for a complete reassessment of the situation in the Great Australian Bight.

The aims of the two cruises are to:

- Verify or refute the permanent existence and regional continuity of the Subtropical Front south of Australia;
- Determine the seasonal variation in position and magnitude of the sea surface temperature gradient across the Subtropical Front south of Australia and in the Tasman Sea;
- Estimate the velocity field and associated transport of the Subtropical Front; and
- Determine the continuity of transport from the east Indian Ocean to the Tasman Sea.

Cruise Narrative

R/ Franklin departed from Outer Harbour, Adelaide shortly after 1300 h on Friday 30 January and made its way to 40°S, 118°E, the position where the major research

programme was to commence. Underway monitoring of the thermosalinograph and ADCP indicated a more southern position of the Front in the region east of 125°E than anticipated, but the Front was encountered near 37°S, 128°E and crossed several times along the track further on. Bad weather made progress difficult at times, and the position 49°S, 118°E was not reached until 0600 h on Wednesday 4 February 1998.

For the following two weeks the pattern of work consisted of zig-zag transects across the Subtropical Front towing the Seasoar between the surface and 250 m depth, with CTD stations at the turning points between transects. The first CTD station at 40°S, 118°E was taken to the sea floor, all other CTD stations to 1500 m depth. Each leg took between 18 and 30 hours to complete. The direction and duration of each transect or leg was determined by the incoming data. The direction of legs 4 and 5 was adjusted to maximize the temperature and salinity gradient along the track. The complete ship's track is shown in Figure 1.

Between legs 9 and 10 the ship proceeded to recover two shallow current meter moorings which were deployed by Dr. Cresswell of the CSIRO on the shelf off western Tasmania at 42° 26.11'S, 145° 01.09'E in 105 m water depth and at 42° 33.16'S, 144° 53.82'E in 192 m water depth. Both moorings were successfully recovered on Sunday 15 February.

The final leg of the cruise had to be cut short by a few hours to respond to a request by Maritime Safety that R/V Franklin assist a yacht in distress off the south coast of Tasmania. By the time R/V Franklin arrived at the indicated position the yacht had sunk and the two people on board, who had spent some time sitting on some rocks, had been picked up by a helicopter. R/V Franklin then proceeded to Hobart to arrive at the CSIRO dock at 1500 h on Tuesday 17 February 1998.

Summary of work completed

Thermosalinograph and ADCP transect from Gulf St. Vincent to 40°S, 118°E.

11 Seasoar transects across the Subtropical Front, each on average 300 km long.

22 CTD stations to 1500 m depth, 1 CTD station to 4500 m depth.

2 current meter moorings recovered.

Personnel

Ship's Crew

Dick Dougal	Master
Arthur Staron	1st Mate
Allan McCarthy	2nd Mate

John Morton	Chief Engineer
Greg Pearce	1st Engineer
Andrew McLagan	Electical Engineer
Jannick Hansen	Bosun
Peter Genge	AB
Wayne Browning	AB
Denis Avery	AB
Les Clark	Greaser
Gary Hall	Chief Cook
Tom Thomson	2nd Cook
Ron Cullinay	Chief Steward

Scientific Party

Prof. Matthias Tomczak	FIAMS Chief Scientist
Dr. Charles James	FIAMS Watch Leader
Mr. Mauricio Mata	FIAMS Watch Leader
Mr. Duncan Tippins	FIAMS
Dr. Lindsay Pender	CSIRO OV Cruise Manager
Mr. Ian Helmond	CSIRO OV
Mr. Phillip Adams	CSIRO OV
Mr. David Terhell	CSIRO OV

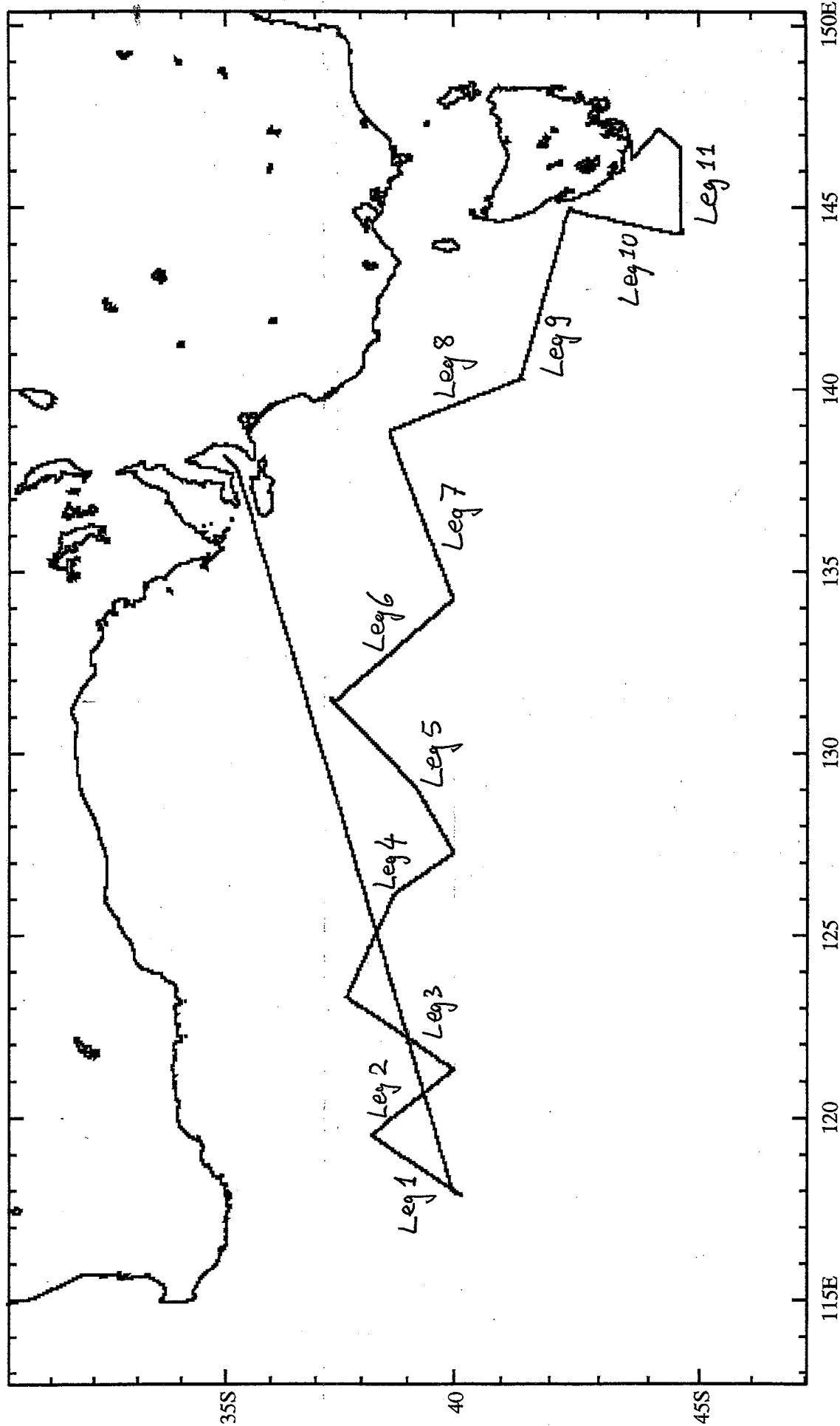


Figure 1 Cruise track, FR02/98