R.V. FRANKLIN

NATIONAL FACILITY
OCEANOGRAPHIC RESEARCH VESSEL

RV FRANKLIN

RESEARCH PLAN

CRUISE FR 7/89

Sails Sydney 0900 Tuesday 16 May 1989
Arrives Launceston (Georgetown) 1600 Friday 2 June 1989

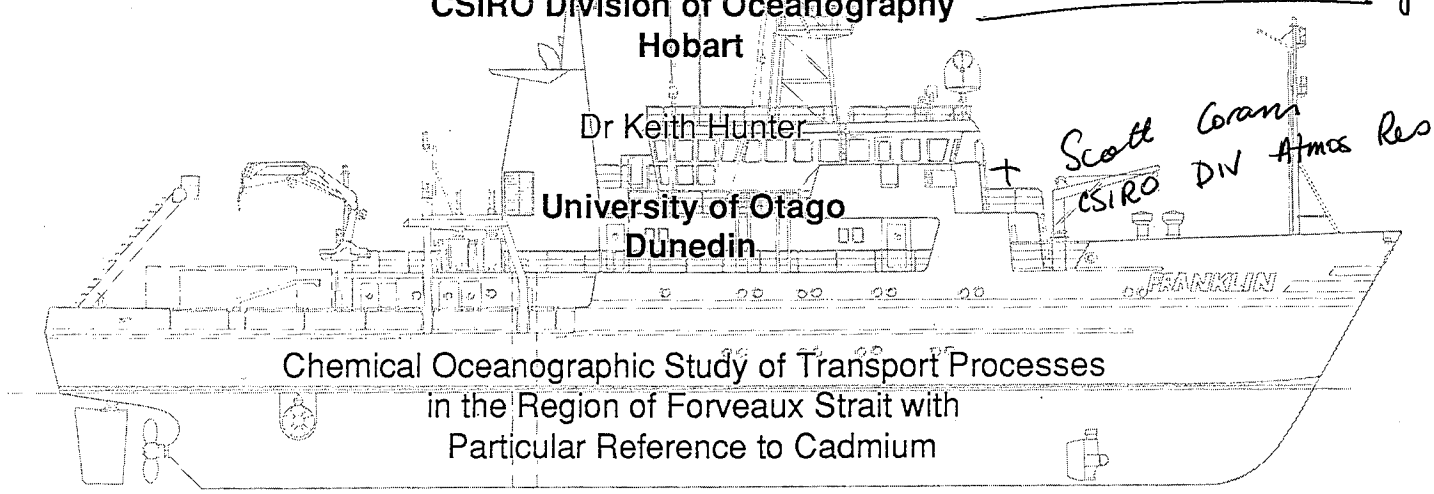
Principal Investigators

Dr Ed Butler
Dr Denis Mackey
Dr John Volkman

CSIRO Division of Oceanography
Hobart

Dr Keith Hunter

University of Otago
Dunedin



Chemical Oceanographic Study of Transport Processes in the Region of Forveaux Strait with Particular Reference to Cadmium

-oOo-

January 1989

For further information contact

ORV Operations Manager
c/- CSIRO Division of Oceanography
GPO Box 1538, Hobart, Tas. 7001
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Telex AA 57182

AUSTRALIA

R.V. FRANKLIN IS OWNED AND OPERATED BY CSIRO

CRUISE PLAN
R.V. *FRANKLIN*
FR07/89

ITINERARY

Depart Sydney:	0900 hrs	Tuesday 16 May 1989
Port Call at Bluff (NZ):		Monday 29 May 1989
Arrive off Georgetown: (for Launceston)	1600 hrs	Friday 2 June 1989

SCIENTIFIC PROGRAM

This cruise is a joint Australian-New Zealand initiative to investigate the physical and chemical features of the waters of Foveaux Strait and the neighbouring waters around the South Island of New Zealand. It is intended to identify chemical tracers that will assist in the classification of discrete water masses and the delineation of frontal features of the Subtropical Convergence. Ultimately this information will assist in interpretation of transport processses in the region. The source of the elevated cadmium levels in the Bluff Oyster population is one applied problem that will be addressed by this program.

PRINCIPAL INVESTIGATORS

Dr Edward Butler
Dr Denis Mackey
Dr John Volkman

CSIRO Division of Oceanography
Marine Laboratories
GPO Box 1538
Hobart TAS 7001

Dr Keith Hunter

Chemistry Department
University of Otago
Dunedin, NEW ZEALAND

CRUISE OBJECTIVES

- Determine the physical oceanographic features of the region
- Collect water samples for trace element analysis using clean techniques
- Investigate surface pH (and thereby p_{CO2}) and fluorescence using continuous data logging of underway pH analyser and Turner fluorometer
- Measure vertical profiles of pH using an electrode fitted to CTD unit 1
- Measure vertical profiles of fluorescence and turbidity using Variosens III interfaced to CTD unit 1

- Collect samples of particulate matter at selected stations using Niskin bottles and Seastar *in-situ* pumps for analysis of lipids, pigments and total CHN. Sediment samples will be collected at some of the stations
- Collect water samples for the analysis of dissolved organic carbon and use hydrophobic adsorbents (XAD-2, C18 Sep-Pak, etc.) to obtain subsamples for analysis by GC-MS, FT-IR and HPLC-AF
- Collect water samples for copper complexing capacity measurements
- Take water samples for on-board intercalibration of Turner fluorometer and Variosens III
- Deploy sediment traps and Seastar *in-situ* pump(s) on short-term moorings to collect sinking particulate matter, and integrated particulate and DOC samples
- Collect sediments and oysters in selected regions of Foveaux Strait

CRUISE TRACK

A possible cruise track is shown in Figure 1. Leg A is to traverse the 'Southland Current' (with the assistance of on-board reception of satellite SST imagery). Leg B is the southward section through frontal structure of the Subtropical Convergence to a deep (6000 m) station in Solander Trough and return to the western entrance of Foveaux Strait. After passage through the Strait, Leg C is a transverse section through the Southland Front. After completing any additional work in Foveaux Strait, New Zealand personnel and their equipment and samples will be offloaded at a port call at Bluff, before sailing for Launceston.

O.R.V. EQUIPMENT REQUIRED

Inmarsat and satellite image reception equipment
Image display terminal
CTD #1 with pH and D.O. probes, and rosette plus 10 l bottles
Variosens III with power supply for deployment on CTD
Chemistry clean container
ADCP
GPS
Thermosalinograph
Turner Fluorometer
Underway pH system
Autoanalyser, oxygen and salinity apparatus
XBTs
Wind speed and direction
PC (AT clone)
Precision depth recorder
Freezers (-20 C and -40 C)
Milli-Q water supply
Ship's refrigerator for storage of non-preserved water samples
Clean cabinet in GP Laboratory

EQUIPMENT PROVIDED BY USERS

Special sampling bottles and ancillary equipment
Kevlar-sheathed hydrowire
Smith-Macintyre grab sampler
Oyster dredge or similar
Sediment traps
Seastar samplers
Pressure system for clean trace metal sampling
Iodate channel for auto analyser (modified from ammonia channel)

SPECIAL REQUIREMENTS

- Chemistry container to be fitted aft
- Kevlar-sheathed hydro-wire to be spooled over existing hydro-wire

PERSONNEL

Edward Butler	Chief Scientist	CSIRO Oceanography
Denis Mackey		"
Jeanette O'Sullivan		"
Patrick Deprez		"
Jeff Butt		"
Bob Beattie		CSIRO-ORV
Erik Madsen		"
Ron Plaschke		"
Bob Griffiths		"
Keith Hunter		University of Otago (NZ)
Russell Frew		"

* Final berth to be selected from a scientist from the CSIRO Division of Atmospheric Research (CO_2 Program) or Jonathon Kim (University of Otago, NZ)

This cruise plan is in accordance with the directions of the National Facility Steering Committee for the Oceanographic Research Vessel *Franklin*

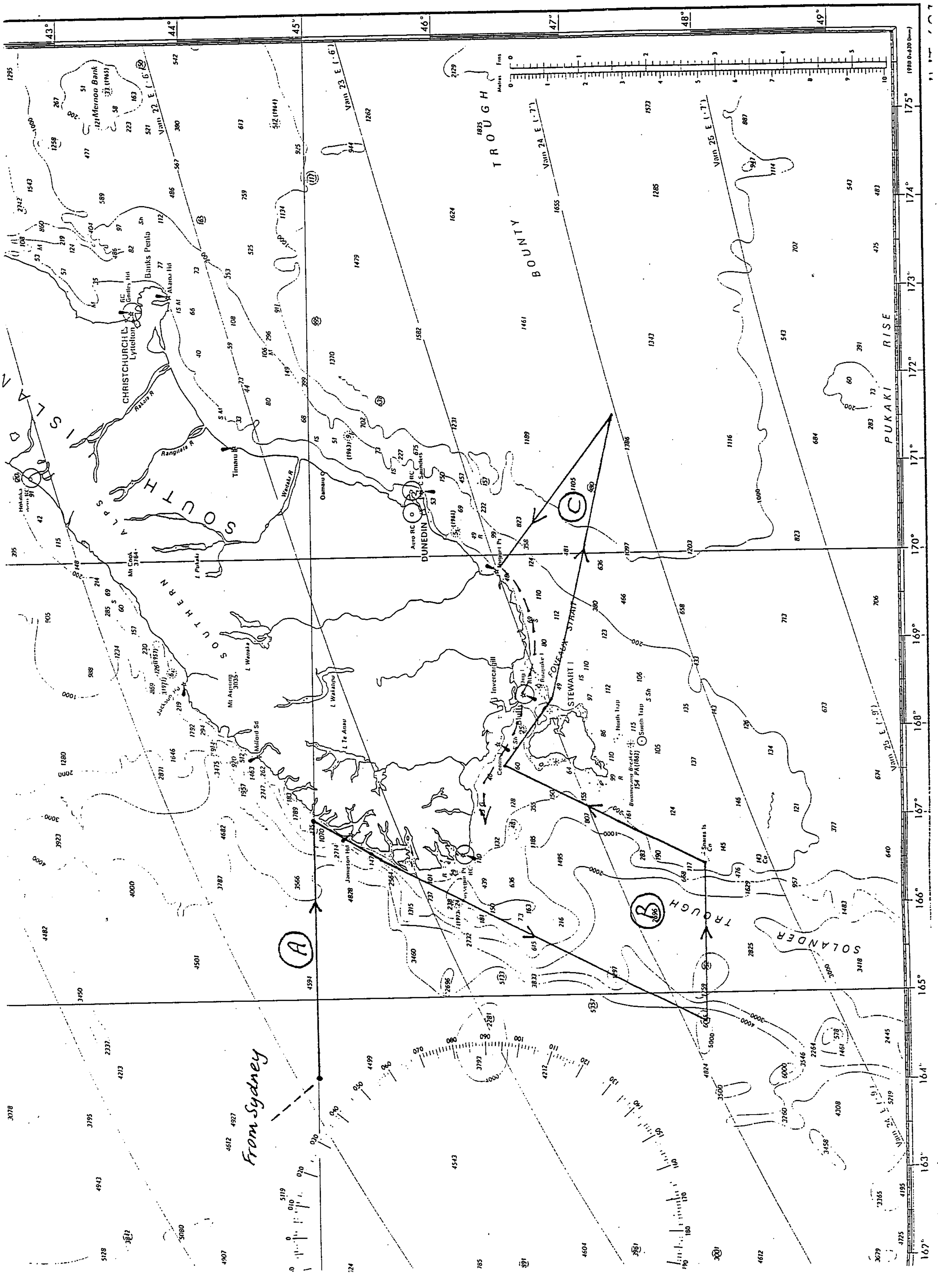
C Fraser A/Chief
for

A.D. McEwan
CSIRO Division of Oceanography

D.H. Green
National Facility Steering Committee

January 1989

FIG. 1



From Sydney
A
B
C
SOUTH ISLAND
SOUTHERN ALPS
CHRISTCHURCH
Lyttelton
Banks Penla
Timaru
Oamaru
DUNEDIN
Invercargill
STEWART I
FOVEAUX STRAIT
BOUNTY TROUGH
PUKAKI RISE
SOLANDER TROUGH
Mernoo Bank
Mt Cook 3764
Mt Aspiring 3035
L Te Anau
L Wakatipu
Milford Sd
Snares Is