

FRANKLIN

National Facility
Oceanographic Research Vessel

RESEARCH SUMMARY

CRUISE FR 5/95

MASS MORTALITY OF PILCHARDS

Itinerary

Sailed Fremantle Tuesday 1800 13 June 1995

Arrived Fremantle Friday 0800 16 June 1995

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Principal Investigators

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June 1995

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FR 5/95

Research Summary Mass Mortality of Pilchards

Itinerary

Sailed Fremantle 1800 13/6/95
Docked Fremantle 0800 16/6/95

Scientific Program

A mass mortality of pilchards (*Sardinops neopilchardus*) commenced off the Eyre Peninsula (near Adelaide) in March 1995. The 'wave of death' spread in both directions along the coastline, reaching Perth and Sydney in May. A National Task Force comprising scientists from five state fishery authorities, three CSIRO Divisions and several Universities was assembled and various explanations of the deaths were advanced, all subsequently to be retracted as more information became available.

On this short cruise we attempted to overcome one of the major obstacles to progress on this issue; the lack of comprehensive physical and biological data from the vicinity of the fish deaths.

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Cruise narrative

In March 1995 a mass mortality of pilchards commenced in The Great Australian Bight and progressed in both directions along the coast, reaching Sydney and Perth in May. A National Task Force was convened by DPIE. One of CSIRO's roles was to coordinate physical and biological oceanographic data acquisition. It was immediately apparent that insufficient oceanographic data were available to prove or disprove the various explanations of the kills that were being put forward. Fortunately, *Franklin* was in Fremantle as the 'kill front' passed, and was available for two and a half days. For a week it appeared that the deaths were remaining in the Rottneest Island area so we planned to occupy a series of 3 lines, starting with the Marmion line of FR4/94.

Four days before sailing, however, kills were reported off Lancelin, and on the day before we sailed kills were occurring off Dongara, 17h steaming north of Perth. Hence we decided to steam north and sample a line in to Dongara first, rather than doing the Marmion line. After completing two stations on that line, we received information that a kill had been sighted that morning very close to the intended fourth station on our line. With an hour of daylight remaining, we proceeded directly to that station but found no dead fish. We completed the line of six stations and decided to spend the little remaining time occupying three stations east of Geraldton, where David Evans was catching live adult pilchards that day. After 24h of continuous work for the net-hauling scientists, our time ran out so we picked up the Leeuwin current south, hoping to gain enough time for at least one station on the Marmion line. Unfortunately, adverse winds left us with insufficient time to occupy a station.

Results

The cruise objective was achieved although only nine stations could be occupied instead of the twenty hoped for because we had to steam farther north than hoped in order to catch up to the 'kill front'. No obvious explanation of the fish kill was forthcoming on the cruise, but analysis of samples may yet turn something up. We are pleased that we did manage to get *Franklin* to the most appropriate sampling location at the time.

Summary

We did not actually sight dead pilchards ourselves, but our samples were taken within several hours and probably 10nm of a reported kill. The current was to the south along most of our cruise track and probably more so over the past week due to northwesterly gales, ruling out advection as an important pathogen vector. Upwelling and blooms of phytoplankton were absent, suggesting these are not necessary either for the kill front to progress. Hence we must await more detailed analyses of our samples (eg electron microscopy for viruses) before potentially contributing positively to the mystery of the pilchard deaths. This is not an unexpected outcome of the cruise, and we are pleased that we now have the data to address the role of physical and biological factors in the pilchard deaths. The cruise has been worthwhile even if the mystery remains. It has also been valuable to have been able to sample the full suite of variables that *Franklin* has sensors for in addition to the biological sampling, given the paucity of such data from this region.

Personnel

David Griffin	CSIRO Oceanography	Chief Scientist
Alan Pearce	"	
Russell Bradford	CSIRO Fisheries	
Tim Lamb	"	
Peter Thompson	"	
Ken White	WA Fisheries	
Stuart Hellen	Curtin University	
Dave Vaudrey	CSIRO - ORV	Cruise Manager
Bob Griffiths	"	
Erik Madsen	"	

Acknowledgements

We would like to thank the Master Neil Cheshire and the crew of the *Franklin* for their fullest cooperation, and also Bob Edwards and the others involved in arranging this cruise on such short notice.

Equipment notes

We had hoped to have the fluorometer on the CTD but apparently the voltage was too low for it to work, probably because of the extra 1000m wire recently added. This caused some delay with the first station. We also hoped to have a pinger on the Bongo nets to avoid hitting the bottom. This did not work either and some sediment was inadvertently sampled at station 1 and one net was lost. Everything else worked well.

June 1995

10.00 13/06 00.00 16/06/95 UTC

