

# data report

PHYSICAL, CHEMICAL AND CURRENT METER DATA

CalCOFI CRUISE 7601  
6-7 January 1976

CalCOFI CRUISE 7602  
16-20 February 1976

CRUISE 7603 (TWATE III)  
30 March-2 April 1976

CRUISE 7604  
17 April-10 May 1976

CRUISE 7611  
11 November 1976

SIO Reference 88-4  
29 February 1988

UNIVERSITY OF CALIFORNIA  
SCRIPPS INSTITUTION OF OCEANOGRAPHY

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CalCOFI CRUISE 7601  
6-7 January 1976

CalCOFI CRUISE 7602  
16-20 February 1976

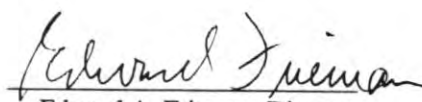
CRUISE 7603 (TWATE III)  
30 March-2 April 1976

CRUISE 7604  
16 April-10 May 1976

CRUISE 7611  
11 November 1976

SIO Reference 88-4  
29 February 1988

Approved for distribution:

  
Edward A. Frieman, Director

## CONTENTS

Introduction .....	3
Literature Cited .....	5
CalCOFI Cruise 7601	
Figure 1, Station Positions .....	6
Personnel .....	7
Current Meter Data .....	7
Tabulated Data .....	8
CalCOFI Cruise 7602	
Figure 2, Station Positions .....	10
Personnel .....	11
Tabulated Data .....	12
Cruise 7603 (TWATE III)	
Figure 3, Station Positions .....	17
Personnel .....	18
Tabulated Data .....	19
Cruise 7604	
Figure 4, Station Positions .....	21
Personnel .....	22
Tabulated Data .....	23
Cruise 7611	
Figure 5, Station Positions .....	52
Personnel .....	53
Tabulated Data .....	54

## INTRODUCTION

The data in this report were collected during CalCOFI Cruises 7601\* and 7602, and Cruises 7603 and 7604 aboard the RV *Alexander Agassiz*, and Cruise 7611 aboard the RV *Ellen B. Scripps* of the Scripps Institution of Oceanography, University of California, San Diego. Although all these cruises were in the area of the California Cooperative Oceanic Fisheries Investigations (CalCOFI), only during 7601 and 7602 were planned CalCOFI station positions occupied. Cruise 7603 was a Two-Way Acoustic Transmission Experiment (TWATE III) on which the principle work accomplished was sound velocity analyses in the vicinity of locations 33°N, 118°W and 31°N, 120°W. The object of Cruise 7604 was to investigate eddies in the California Current, to determine their size, their movement in relationship to other currents, and the length of time they remain a distinguishable feature. A series of airborne expendable bathythermographs (AXBTs) used in a program to observe the thermal structure in the Central Pacific were calibrated by comparison with eight STD lowerings during Cruise 7611. This field program has been described in SIO Reference 76-19, Observation of Thermal Structure in the Central Pacific, T. P. Barnett, M. H. Sessions, and P. M. Marshall.

These data were collected and processed by personnel of the Data Collection and Processing Group, Marine Life Research Group (DCPG\*\*, MLRG), Scripps Institution of Oceanography.

## STANDARD PROCEDURES

The difference in purpose of the five cruises in this report results in a variation of the data collected. Hydrographic casts were made on all cruises but varied from only one cast of eight Nansen bottles on the STD wire for Cruise 7601 to 20 casts of 18 Nansen bottles on the hydrographic wire for Cruise 7604. Temperature and salinity were determined for all depths sampled. Oxygen and nutrients were determined for Cruise 7602 only. On Cruise 7601 the four free vehicle current meters which had been deployed during CalCOFI Cruise 7510 were recovered.

On STD lowerings during Cruises 7601, 7602, 7603, and 7611 where hydrographic casts were not made, a Nansen bottle was usually placed a few meters above the STD and another bottle was lowered to approximately 10 meters. During Cruise 7602, both down and up recordings from the STD were made on two separate DDL systems as well as analog traces for all lowerings.

Paired protected reversing thermometers were used on all Nansen bottle casts to determine temperatures which are recorded to hundredths of a degree Celsius. Sampling bottles used below a depth of 100 meters were equipped with unprotected thermometers for determination of depth of sampling.

Salinity samples were determined at sea using inductive-type salinometers. The salinity values are recorded to three decimal places.

Dissolved oxygen on Cruise 7602 was determined by the Winkler method as modified by Carpenter (1965), using the equipment and procedure outlined by Anderson (1971).

Silicate, nitrate and nitrite for Cruise 7602 were determined at sea using an automated analyzer. The procedures used are similar to those described in Atlas *et al.* (1971). Phosphate samples were determined using a Gilford modified DU spectrophotometer. Reactive phosphate was analyzed using the method of Murphy and Riley (1962), with the specific procedure outlined by Anderson (1971).

The observed data have been evaluated using the methodology described by Klein (1973). This involves consideration of their variation as functions of density or depth and their relations to each other, and comparisons with adjacent observations.

The STD data for Cruises 7601, 7604, and 7611 were processed by computer from the DDL recordings and appear to compare well with the hydrographic data. Although extra effort was made on Cruise 7603 to compare the STD recordings on two separate DDL instruments, the tabulated data were digitized from the analog traces and also

\* The first two digits represent the year and the last digits the month of the cruise.

\*\* Now the Oceanographic Data Facility (ODF).

appear to compare well with the hydrographic data.

#### TABULATED DATA

The reported hydrographic cast time is the Greenwich Mean Time (GMT) of the messenger release. Bottom depths, determined acoustically, have been corrected using Matthews (1939) tables and are reported in meters. Weather conditions have been coded using WMO code 4051.

Data tabulations are presented in the following forms:

1) Data from the sample bottle casts are tabulated with the observed levels of depth on the left of the page, and standard depth values of temperature, salinity and oxygen interpolated from these observations are on the right of the page. Additional computed values are also presented.

2) Data from the STD lowerings are presented with two stations printed side by side. Temperature and salinity are tabulated at closer standard intervals than the interpolated standard depth bottle data. Additional computed values are also presented.

3) Calibration of the AXBTs on Cruise 7611 required the data from the STD to be tabulated at approximately 10 meter intervals of depth. The additional computed values are tabulated for each depth.

4) Current meter speed and direction data were calculated over one-half-hour intervals. This report includes only the resultant speeds and directions for the entire record lengths.

The same parameters have been tabulated in this report as in previous reports. Cruises 7601 and 7602 have the CalCOFI station designations which have been in use for over thirty years. The first part specifies a line normal to the general trend of the coastline (CalCOFI line). The second part specifies a station position relative to the coast on the CalCOFI line. On some closely-spaced special inshore stations, an additional superscript number may appear after the line number or station number to indicate a finer resolution of the non-standard station location.

The column headings are to be interpreted as follows:

Z	Depth	Meters
T	Temperature	°C
S	Salinity	‰
O2	Dissolved Oxygen	ml/L
PO4	"Reactive" inorganic phosphate-phosphorous	µg at/L
SiO3	"Reactive" inorganic silicate-silicon	µg at/L
NO2	"Reactive" nitrite-nitrogen	µg at/L
NO3	"Reactive" nitrate-nitrogen	µg at/L
DT	$\delta_T$ Thermosteric anomaly	cl/ton
SIGT	$\sigma_t = (\rho_{s,t,0} - 1) 10^3$ where $\rho_{s,t,0}$ is the density the parcel of sea water would have if moved isothermally to the sea surface.	g/L
DD	Geopotential anomaly, referred to the sea surface.	dyn. meters

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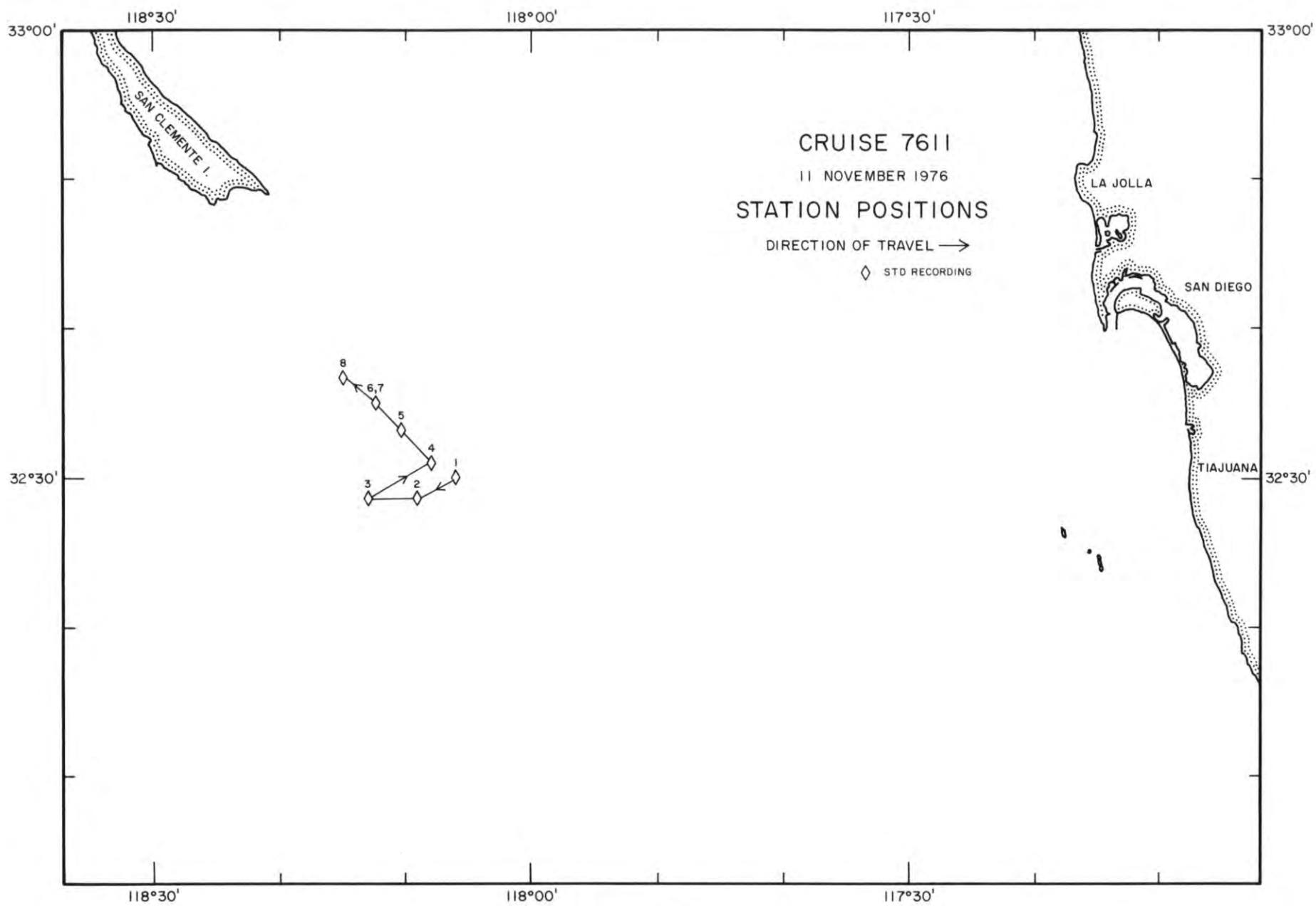


FIGURE 5

PERSONNEL

Cruise 7611

SHIP'S CAPTAIN

Davis, Laurence E., RV *Ellen B. Scripps*

PERSONNEL PARTICIPATING IN THE COLLECTION OF DATA

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