

BSPE 00216-388-7

鎮海灣 海洋觀測資料(1980~1983) 整備事業

A Study on Data Management System
based on Physical Oceanographic Data collected
in Chinhae Bay (1980-1983)

1991. 7.

韓國海洋研究所

제 출 문

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본 보고서를 "진해만 해양관측자료 정비사업(1980-1983)" 사업의 연구보고서로 제출합니다.

1991년 7월

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요 약 문

I. 연구제목

진해만 해양관측자료(1980-1983) 정비사업

II. 연구의 목적 및 중요성

1. 해양관측이 동반되는 연구사업의 경우 연구사업의 싯점에서 자료의 관리방안 (통일된 기재양식 및 사업종료 후 자료보관 등)이 수립되어 있지 않으면 사업종료후 시간의 경과와 함께 자료관련 정보의 유실이 심하다. 특히 자료의 편찬작업에는 자료의 과학적 분석을 위한 일차적인 고려사항이 많이 수반되고 있는데, 이를 소홀히 하여 자료해석상 필요한 정보가 확보되지 않은 탓으로 자료의 추후 활용에 많은 제한이 따른다.
2. 해양선진국의 해양 관련기관에서는 일정한 목표하에 수집된 각종 해양 관측 자료에 대하여 관련 연구사업이 종료된 후, 또는 일정해역에서 관측된 자료가 축적된 후 수집된 관측자료를 정리, 처리하여 자료집의 형태로 편찬하는 사례가 많이 있다.
3. 1980년부터 1983년까지 (4년간) 계속사업으로 수행된 "진해만 적조 및 오염 모니터링 시스템 개발을 위한 연구" 사업을 통해 수집된 해양물리, 해양화학, 해양생물 관측 자료는 동일한 해역 내에서 공동 보조하에 수집된 해양연구소 최초의 종합적인 관측 자료라고 할 수 있다.

그러나 관측자료의 소재가 분산되어 있고, 자료의 기재양식이 자료의 장기적인 보관 및 활용 등을 고려하여 설정되지 못하였으며, 또한 사업종료 후 관련된 연구 인력의 변동 내지는 이직 등으로 말미암아 자료의 추적, 활용이

점차 어려워지고 있고, 이미 자료의 분류나 확인이 불가능한 문제점이 나타나고 있는 실정이다.

4. 따라서 현존 자료나마 가능한 한 수집.정리하여 일정 양식의 형태로 편집하고, 자료의 D/B화를 위한 처리.검색.보관 과정을 정립하며, 자료집 발간에 따른 필수적인 제과정을 숙지하여 추후 연구소의 각 연구 사업 종료시 자료집 발간 업무를 용이하게 수행할 수 있는 기술 및 경험 축적이 필요하다.

III. 연구개발의 내용 및 범위

1. 해양 관측 자료의 D/B화를 위한 처리.검색.보관 과정을 OJT를 통하여 숙지하고, 연구소의 연구사업을 통하여 생산되는 각 종류의 관측 자료를 D/B화할 수 있는 경험을 축적하며 관련 문헌, 프로그램 등을 수집.
2. 자료집의 편찬 및 발간에 선행하는 제반 자료관리 과정과 필수요건을 습득하여 연구소 소장의 자료집 발간업무에 활용.
3. 진해만에서 관측된 일부 자료를 취급하여 자료 관리상의 체계를 시험 구축함으로써 연구소 관측 자료관리시스템 구축에 필요한 경험 축적.
4. 진해만 관측 자료의 해양조사보고 서식에 의거한 Inventory 작성

SUMMARY

I. Title

A Study on data Management System based on Physical Oceanographic Data collected in Chinhae Bay(1980-1983)

II. Objectives and Significance

1. In research works which involve field observations one easily loses track of the acquired data and related information as time passes if appropriate data formats and ways of data management are not set up at the beginning. Especially in compilation activities of data which require various considerations on information about the data for scientific analyses, lack of information on the data puts serious limits to the usefulness of the data.
2. It is usual in foreign institutions with active research works in oceanography that acquired data and available information on the data are passed through due processes and finally compiled into data book for open uses.
3. The KORDI conducted a four year research project, from 1980 through 1983, on the monitoring system for the red tides in Chinhae Bay and adjacent areas, producing large amount of data in physical, chemical, and biological disciplines of oceanography common in time and area.

But the acquired data have been kept separately by the research members who most use them and the data formats used for the data were not prepared for long term data management purposes. The research members have been in and out since the project was over, leaving the data behind in oblivion and it is now getting difficult to trace back almost a decade old data.

4. Therefore it is necessary to track the available data back and compile them into set formats through appropriate steps; to set up the data processing, archives, and retrieval systems; and to accumulate the knowledge necessary for data management and data publication of ongoing research projects.

III. Research Content and Scope

1. Work experience in data processing, archives and retrieval through the on-the-job training; acquisition of related references, manuals, softwares, and computer programs.
2. Case studies on data compilation and publication.
3. Practice in setting the data management system using the data from Chinhae Bay(1980-1983).
4. ROSCOP inventory of physical oceanographic data from Chinhae Bay(1980-1983).

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제 1 장 서 론

제 1 절 사업목적 및 내용

1. 사업목적

1980년부터 1983년까지 4년간 계속사업으로 수행된 "진해만 적조 및 오염 모니터링 시스템 개발을 위한 연구" 사업을 통해 수집된 해양물리, 해양화학, 해양생물 관측자료는 동일한 해역내에서 공동보조 하에 수집된 해양연구소 최초의 종합적인 관측자료라고 할 수 있다.

그러나 관측자료가 관련부서에 분산·소장되어 있고, 자료의 기재양식이 자료의 장기적인 보관 및 활용 등을 고려하여 선정되지 못하였으며, 또한 사업종류 후 시간이 경과함에 따라 연구인력의 변동 내지는 이직 등으로 말미암아 현존하는 당시 자료를 추적·활용하기가 점차 어려워지고 있고, 이미 자료의 분류나 확인이 불가능한 것도 있는 등 문제점이 나타나고 있는 실정이다.

따라서 현존하는 자료나마 가능한 한 수집하여 ROSCOP 양식으로 정리하고, Inventory Data를 추출·DB화 하며, 최종적으로 자료집을 편찬하여 자료가 효율적으로 활용되도록 하는데 목적이 있다.

2. 사업내용

가. 자료집 편찬. 발간에 앞서서 자료의 입수에서 비롯되는 검색정보추출, 자료의 편집, 자료의 질검증, 자료의 저장 및 회수, 사용자 서비스 등의 다양한 성질의 업무를 거쳐야 되는 자료처리 및 관리체계에 관해서 사례조사를 통하여 관련 자료를 수집하고 숙지.

나. 자료집 발간에 선행되는 제반자료의 준비과정에 관해서 기존자료집을 검토
다. 미국 해양자료센터(NODC)의 자료 관리체제를 OJT를 통해서 이해하고 진해
만의 일부 자료를 대상으로 하여 KORDI에 맞는 시스템 구축을 시도
라. 끝으로 대상 자료를 선별하여 ROSCOP(Report of Observations/Samples
collected by Oceanographic Programmes by IOC, 2nd edition) 양식으로 정리하
는 데에 사업 내용을 국한하였다.

제 2 절 대상 자료와 소재 파악

본 사업에서 취급된 대상 자료는 정부 지원 하에 1980년부터 1983년까지 4개
년 간 계속사업으로서 수행되어 해양연구소 연구보고서 BSPE00022-43-7, BSPE00031-
56-7, BSPE00044-66-7, BSPE00048-80-7로 보고된 일련의 연구 사업 "진해만의 적조
및 오염 모니터링 시스템 개발을 위한 연구"의 관측 자료중 해양물리분야의 자료로
서 소재파악과 수집이 가능시 된 자료이다.

원래의 연구사업 수행시에 설정되었던 연구대상해역과 관측정점은 [Fig.1-1]
에서 [Fig.1-4]까지 나타난 바와 같으며 관측정점의 위치는 [Table 1-1]에서 [Table
1-3]까지 나타나 있다.

자료의 소재파악은 관련 기록물 - 자료기록야장, 일지, 장비 Log Book 등 - 을
수집하여 추적하던가, 관련 부서의 협조하에 자기기록테이프를 복사,입수하는 방법에
의존하였다.

그러나 자기기록테이프에는 각기 상이한 형식으로 머릿 정보가 수록되어 있어
서 자료의 출처를 소급,확인하기가 어려웠고 보조자료로써 활용 가능한 기록물조차
정보의 누락이 빈번하여 자료형태의 정확한 인지가 용이하지 못하였고, 불가한 경우
도 많았다.

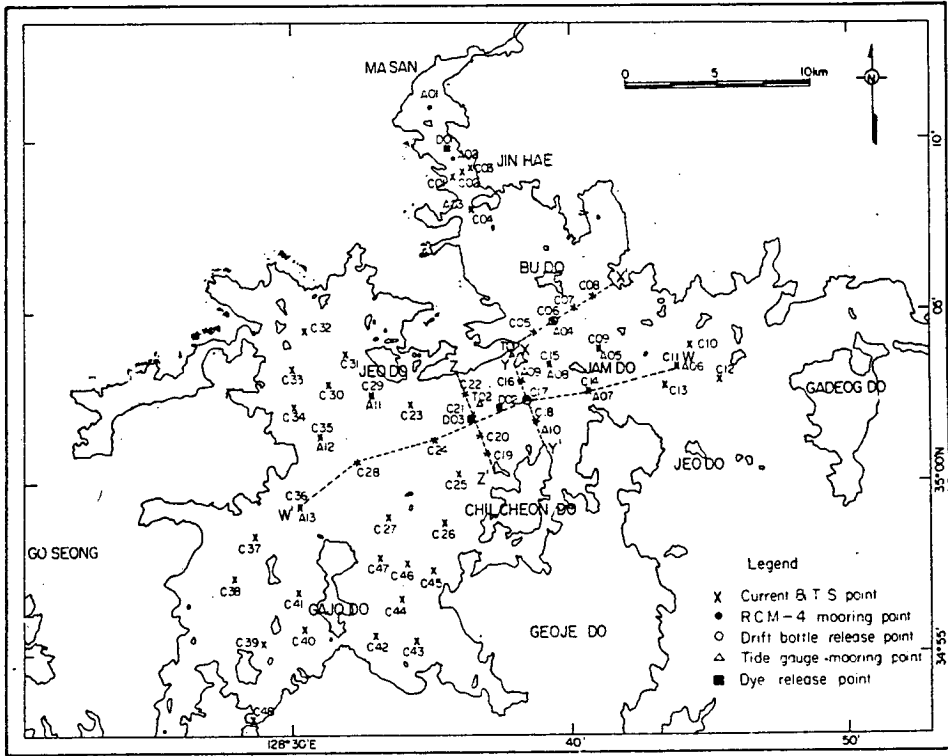


Fig.1-1. Locations of the Oceanographic Stations in Chinhae Bay(1980).

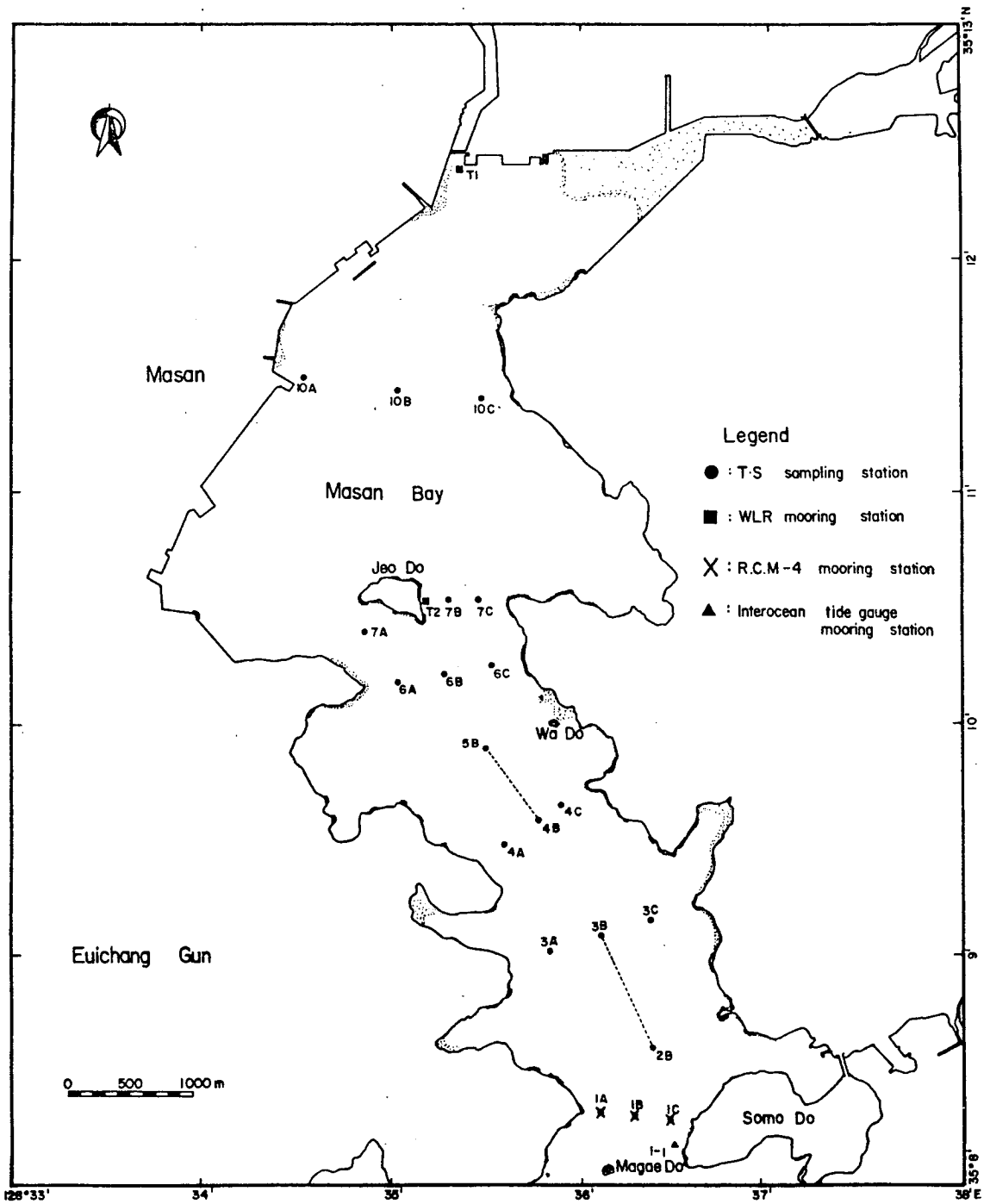


Fig.1-2a. Locations of the Oceanographic Stations in Masan Bay(Jul. 24 - Aug. 1, 1981)

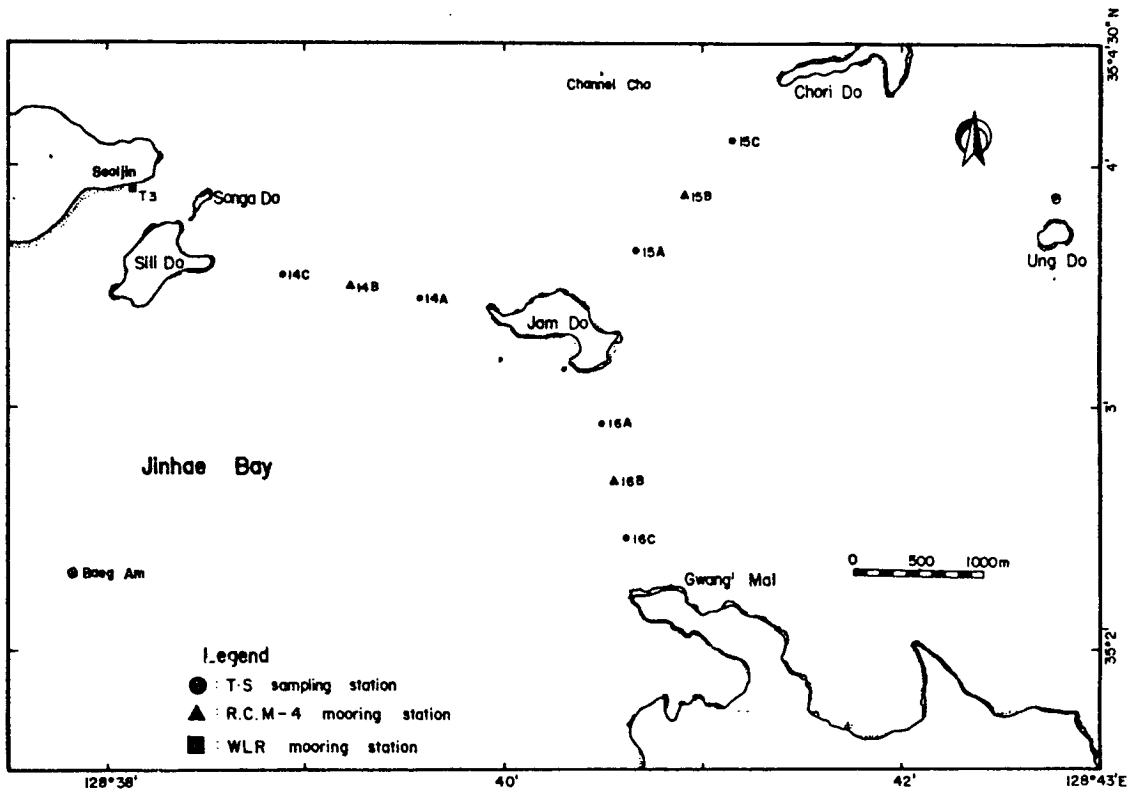


Fig.1-2b. Locations of the Oceanographic Stations around Chamdo(Sept. 24 - 29, 1981).

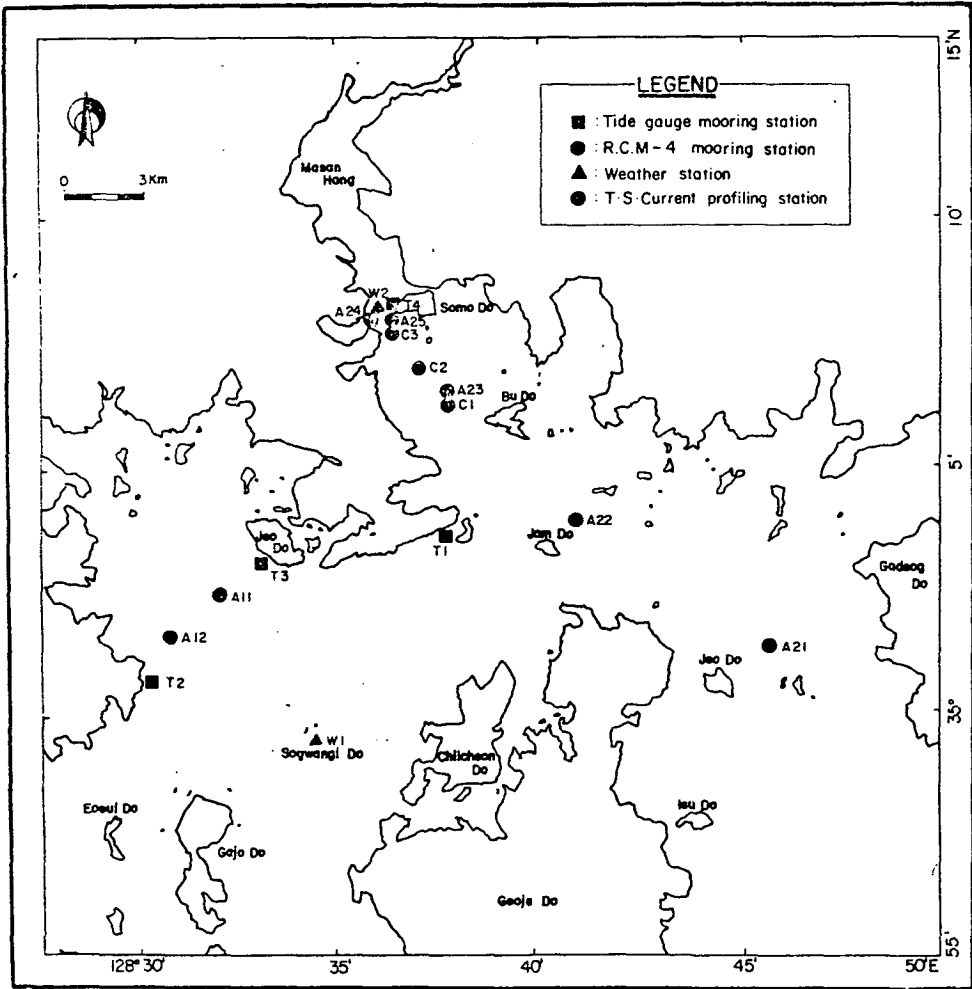


Fig.1-3. Locations of the Oceanographic Stations in Chinhae Bay(1982).

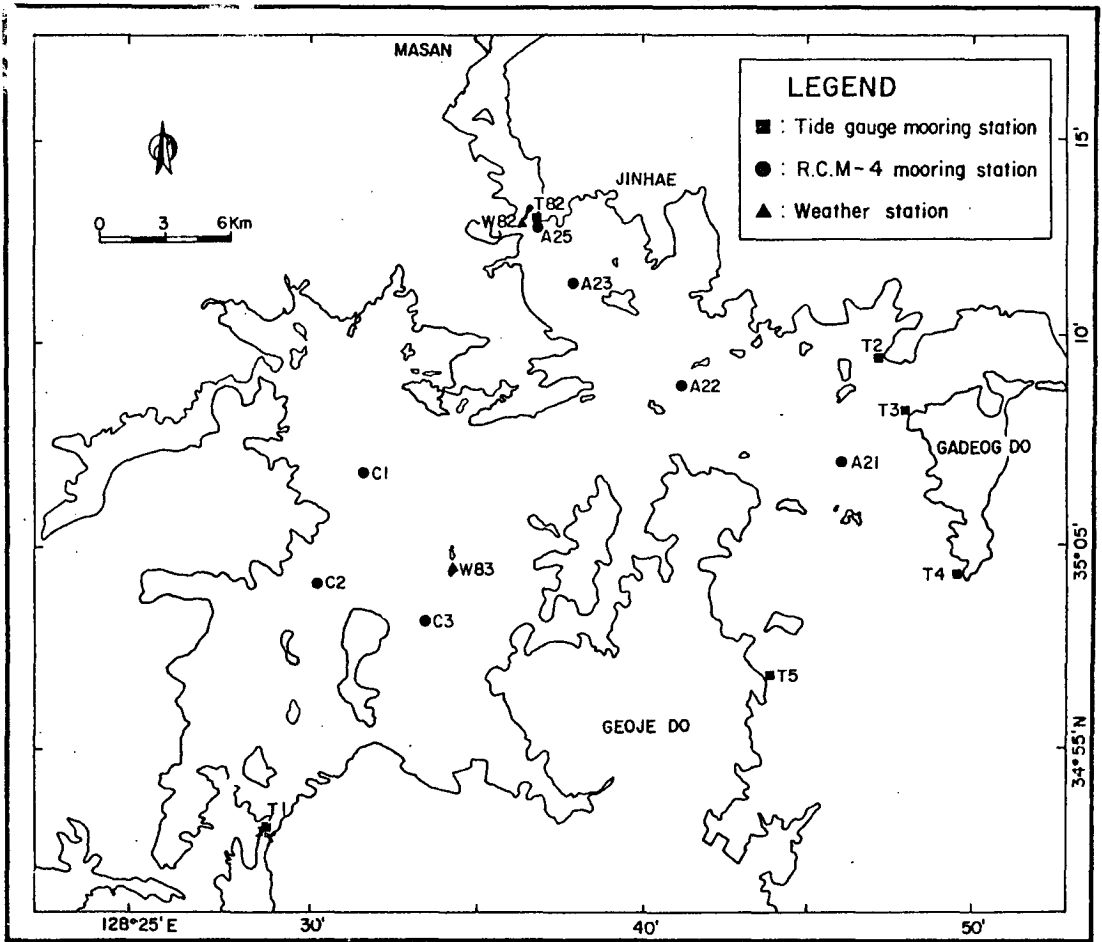


Fig.1-4. Locations of the Oceanographic Stations in Chinhae Bay(1983).

Table 1-1. Locations of the Oceanographic Stations in Chinhae Bay(1980).

Station classification	Station	Depth (m)	Location	Remarks	
Current & T.S. station	CO1	12	35°09'00"N, 128°35'50"E	Drift bottle release point	
	02	13	35°09'05"N, 128°36'05"E		
	03	13	35°09'10"N, 128°36'23"E		
	04	30	35°08'05"N, 128°36'25"E		
	05	14	35°04'18"N, 128°38'51"E		
	06	10	35°04'39"N, 128°39'36"E		
	07	10	35°05'05"N, 128°40'16"E		
	08	10	35°05'14"N, 128°40'54"E		
	09	20	35°03'50"N, 128°41'10"E		
	10	14	35°04'00"N, 128°44'00"E		
	11	20	35°03'21"N, 128°43'42"E		
	12	20	35°02'50"N, 128°44'40"E		
	13	30	35°02'20"N, 128°42'30"E		
	14	50	35°02'50"N, 128°40'40"E		
	15	23	35°03'30"N, 128°39'20"E		
	16	25	35°03'00"N, 128°28'13"E		
	17	21	35°02'25"N, 128°38'30"E		Drift bottle release point
	18	18	35°01'45"N, 128°38'46"E		
	19	23	35°00'45"N, 128°36'57"E		
	20	20	35°01'20"N, 128°36'39"E		
	21	19	35°01'53"N, 128°36'26"E		
	22	20	35°02'36"N, 128°36'08"E		
	23	18	35°02'10"N, 128°34'11"E		
	24	20	35°01'11"N, 128°34'57"E		
	25	18	35°00'00"N, 128°36'00"E		
	26	21	34°58'45"N, 128°35'22"E		
	27	21	34°58'52"N, 128°33'29"E		
	28	21	35°00'42"N, 128°32'24"E		

Table 1-1. Continued.

Station classification	Station	Depth (m)	Location	Remarks
Current & T.S. station	C29	16	35°02'23"N, 128°32'46"E	
	30	16	35°02'39"N, 128°31'28"E	
	31	13	35°03'47"N, 128°31'47"E	
	32	13	35°04'24"N, 128°30'29"E	
	33	16	35°03'11"N, 128°30'07"E	
	34	16	35°02'02"N, 128°30'09"E	
	35	18	35°01'26"N, 128°31'08"E	
	36	34	34°58'16"N, 128°30'03"E	
	37	20	34°58'16"N, 128°28'44"E	
	38	18	34°57'10"N, 128°27'48"E	
	39	13	34°55'18"N, 128°29'00"E	
	40	13	34°55'26"N, 128°30'23"E	
	41	13	34°56'41"N, 128°30'15"E	
	42	20	34°55'34"N, 128°32'54"E	
	43	20	34°55'26"N, 128°34'31"E	
	44	22	34°56'49"N, 128°33'41"E	
	45	20	34°57'18"N, 128°34'55"E	
	46	21	34°57'37"N, 128°34'05"E	
47	20	34°57'39"N, 128°33'07"E		
48	8	35°52'52"N, 128°28'32"E		
RCM-4 (Aanderaa) mooring station	A01	8	35°10'55"N, 128°35'05"E	
	02	14	35°09'31"N, 128°35'47"E	
	03	30	35°08'05"N, 128°36'25"E	C04
	04	10	35°04'39"N, 128°39'36"E	C06
	05	20	35°03'50"N, 128°41'10"E	C09
	06	20	35°03'21"N, 128°43'42"E	C11
	07	50	35°02'50"N, 128°40'40"E	C14
	08	23	35°03'30"N, 128°39'20"E	C15
	09	25	35°03'00"N, 128°38'13"E	C16

Table 1-1. Continued .

Station classification	Station	Depth (m)	Location	Remarks
RCM-4 (Aanderaa) mooring station	10	18	35°01'45"N, 128°38'46"E	C18
	11	16	35°02'23"N, 128°32'46"E	C29
	12	18	35°01'26"N, 128°31'08"E	C35
	13	20	34°58'44"N, 128°30'03"E	C36
Tide station	T01	3	35°04'00"N, 128°38'12"E	
	02	3	35°02'13"N, 128°36'44"E	
Dye release station	D01	13	35°09'40"N, 128°35'38"E	
	02	20	35°02'12"N, 128°36'44"E	
	03	20	35°01'50"N, 128°36'17"E	

Table 1-2a. Oceanographic Stations for the period from July 24 to August 1 1981 in Masan Bay.

1) Temperature, salinity and current (hourly measurement)

Station No.	Latitude	Longitude	Sonic depth(m)
1A	35° 8' 18.9" N	128° 36' 5.7" E	22
1B	35° 8' 18.3" N	128° 36' 16.8" E	26
1C	35° 8' 17.6" N	128° 36' 28"E	18
2B	35° 8' 37.4" N	128° 36' 12.3" E	14
3B	35° 9' 4.9" N	128° 36' 6"E	13
4A	35° 9' 28" N	128° 35' 36" E	14
4B	35° 9' 34" N	128° 35' 46.2" E	14
4C	35° 9' 39" N	128° 35' 53.9" E	15
5B	35° 9' 53" N	128° 35' 30" E	13
6A	35° 10' 11" N	128° 35' 2.5" E	11
6B	35° 10' 13" N	128° 35' 17.5" E	11
6C	35° 10' 15.1" N	128° 35' 22" E	13
7A	35° 10' 23.6" N	128° 34' 52" E	13
7B	35° 10' 32.2" N	128° 35' 19" E	12
7C	35° 10' 32.2" N	128° 35' 28" E	14
10A	35° 11' 28.7" N	128° 34' 33" E	7
10B	35° 11' 25.8" N	128° 35' 2" E	6
10C	35° 11' 23.5" N	128° 35' 29" E	6

2) Continuous current measurement by Aanderaa RCM-4

1A	35° 8' 18.9" N	128° 36' 5.7" E	22
1B	35° 8' 18.3" N	128° 36' 16.8" E	26
1C	35° 8' 17.6" N	128° 36' 28" E	18

3) Water level measurement by Aanderaa WLR

T1	35° 12' 24" N	127° 35' 24" E	
T2	35° 10' 32" N	127° 35' 10" E	

4) Water level measurement by Interocean Tide gauge

I1	35° 8' 6.8" N	128° 36' 33" E	
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Table 1-2b. Oceanographic Stations for the period from Sept. 24 to 29, 1981
around Chamdo.

1) Temperature, salinity and current (hourly measurement)

Station No.	Latitude	Longitude	Sonic depth(m)
14A	35 ^o 3' 28" N	128 ^o 39' 36" E	26
14C	35 ^o 3' 32" N	128 ^o 38' 54" E	27
15A	35 ^o 3' 40" N	128 ^o 40' 41" E	27
15C	35 ^o 4' 7" N	128 ^o 41' 9" E	22
16A	35 ^o 2' 56" N	128 ^o 40' 30" E	48
16C	35 ^o 2' 28" N	128 ^o 40' 38" E	40

2) Continuous current measurement by Aanderaa RCM-4

14B	35 ^o 3' 29" N	128 ^o 39' 14" E	24
15B	35 ^o 3' 53" N	128 ^o 40' 55" E	22
16B	35 ^o 2' 42" N	128 ^o 40' 34" E	43

3) Water level measurement by Aanderaa WLR

T3	35 ^o 3' 51" N	128 ^o 37' 56" E	
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Table 1-3. Specification of Tide, Current and Weather Measurements(Feb. - Mar., 1983).

Station	Sampling interval (min)	Data file name	Locations		Observation Depth (m)
			Latitude	Longitude	
T 1	10	W 43183	34°53'00"	128°28'20"	4.5
T 2	10	W 58703	35°04'30"	128°47'20"	7
T 3	10	W 58803	35°03'00"	128°48'00"	6.5
T 4	10	W 43083	34°59'15"	128°49'40"	7
T 5	10	W 52407	34°56'45"	128°43'40"	6
C 1 U	10	R 566608	35°01'55"	128°31'40"	2.7 (18)*
C 1 B	10	R 566406	"	"	13
C 2 U	10	R 475983	34°59'00"	128°31'15"	6.7 (25)*
C 2 B	10	R 566509	"	"	20
W 83	10	RD 69814	34°59'13"	128°34'15"	

* bottom depth (m)

제 2 장 해양관측자료의 관리 및 자료집 발간을 위한 고려사항

제 1 절 자료집 구성요건

해외의 해양관련 연구기관에서는 일정한 목적하에 수집된 각종 해양관측자료에 대하여 관련 연구사업이 종료된 후, 또는 일정 해역에서 관측된 자료가 축적된 후에 수집된 관측자료를 정리, 처리하여 자료집의 형태로 편찬하는 사례가 많이 있다.

이러한 자료집은 흔히 해양도의 출판에 동반하여 도면의 이해를 도울 뿐만 아니라 사용자에게 독자적인 연구계산의 기회를 제공하고 자료의 항구적인 기록물로서도 제기능을 한다.

해양관측자료의 입수에서 비롯하여 발간에 이르기까지 이면에서 수행되는 일의 내용을 구체적으로 파악하기 위하여 다수의 자료집을 선별하여 대표적인 예로서 그 구성내용을 살펴보았다.

자료집을 구성하고 있는 내용들은 대체로 Summary Cruise (Platform) Information, Cruise Track and Station Map, 자료의 계산 및 분석방법, 각 항목소개 등으로 대별할 수 있으며, 이들 구성요건의 구체적인 내용은 다음과 같다.

1. Summary Cruise (Platform) Information

- 각 Field에 따른 항목, R/V, Station의 수, 수행국가 및 기관, 관측기관, 관측형태, R/V (Platform) Code 및 제원소개
- 해역별 및 수심별 관측빈도

2. Cruise Track 및 Station Map

- 각 Station의 위치를 기록 (Table로 표시)
- 연도별 Track Chart를 도면화
- 관측된 전해역의 세분방법 (Marsden 10° Squares Method 등)
- 세분된 해역상에 Station 위치를 도면화

3. 자료의 계산방법 및 분석방법

- 현장자료로 계산된 항목의 계산방법의 설명(σ_t, Sound Speed, Salinity 등)
- 현장에서의 Sample 취급방법 및 실험실에서 분석한 방법에 대해 설명

4. 각 항목 소개

- 자료집에 수록된 각 항목에 대한 상세한 내용을 기술
- 수집된 자료의 전산화에 따른 Data Format에 대하여 설명
- 전산화 작업에 사용된 Code 소개 (WMO Code 등)

이 외에 설명이 필요한 Metadata 성격의 내용들은 일괄하여 서설 등에서 별도로 언급되고 있는데, 언급된 Metadata와 참고한 발간물은 아래와 같다.

발행기관 및 발간물명	내 용
NODC(USA) Oceanographic Station Data	<ul style="list-style-type: none"> ○ 자료출처 및 처리기관 ○ 발간목적 ○ 자료정밀도에 대한 정도 소개 ○ Error에 대한 교정가부와 교정시 방법
JODC(JAPAN) Data Report of KER	기술한 내용이 없음
IOC Indian Ocean: Colloected Data on Primary Production, Plankton, Pigments, and Some Related factors	<ul style="list-style-type: none"> ○ 자료출처(Atlas발간에 사용된 자료) ○ 연도별 진행된 Cruise 소개와 수행국가 명시 ○ 수집된 자료상태에 대한 일반적인 언급 ○ Station 위치 및 채취방법과 기간
Scripps Institution (USA) Oceanic Observations of Pacific	<ul style="list-style-type: none"> ○ 자료출처와 관측된 해역 ○ 기술된 자료의 표현에 관한 일반적 사항(수심, 항목 등)
Institution of Oceanography National Taiwan University(Taiwan) Oceanographic Data of Kuroshio Studies	<ul style="list-style-type: none"> ○ Research Vessel의 소개 및 관측기간 ○ 관측방법과 기기의 검교정에 관한 사항
MEDS(Canada) Oceanographic Data Transmitted from the Flemish Cap Area Sep- tember 1979 to Decem- ber 1980	<ul style="list-style-type: none"> ○ 자료제공처 및 제공일 ○ Cruise Track에 관한 일반적인 언급 ○ 관측기간
국립수산진흥원 해양조사연보	<ul style="list-style-type: none"> ○ 자료집 각 항목에 대한 설명과 측정방법

* 발간물 명

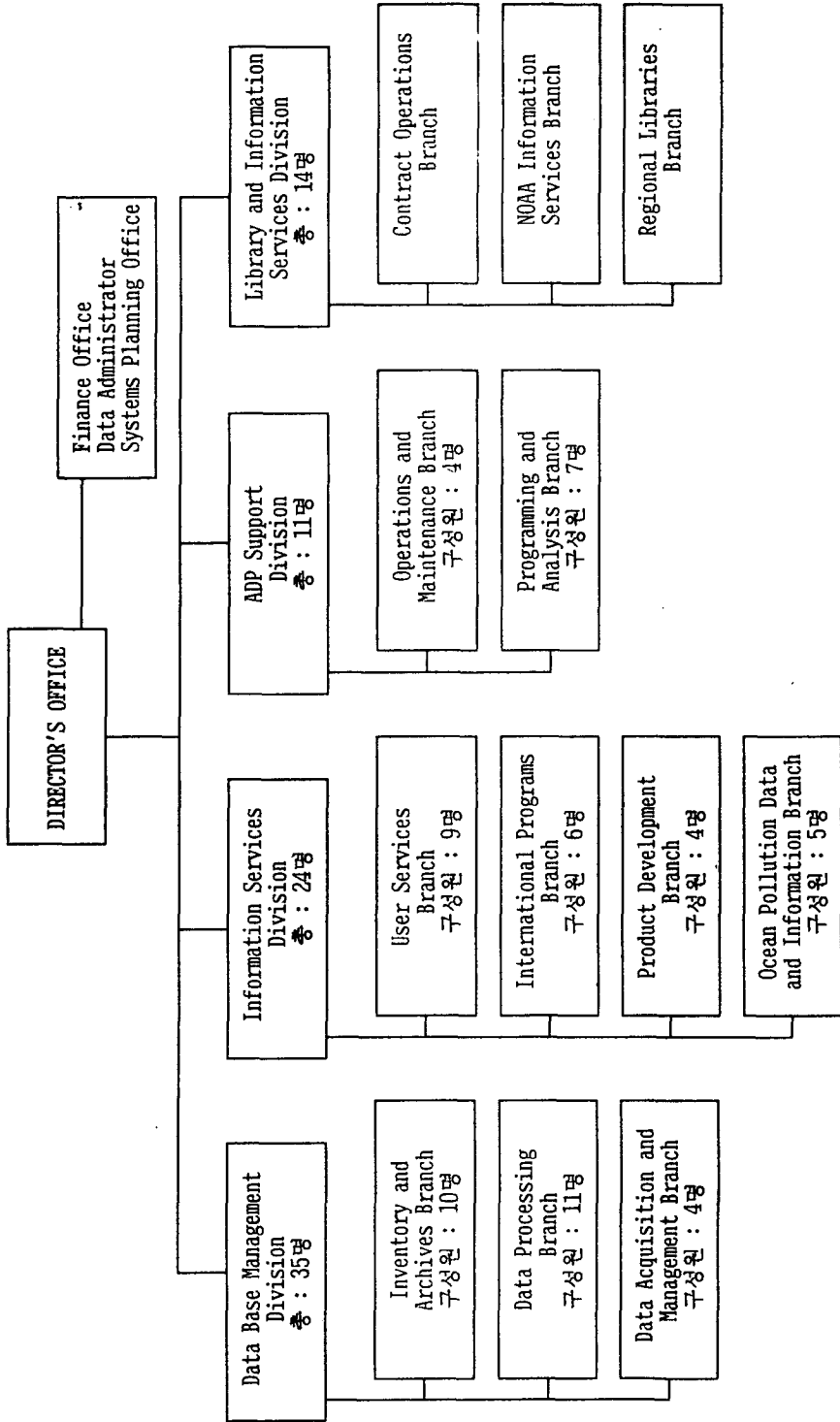
- Scripps Institution of Oceanography of the University of California.
1965. Oceanic Observations of the Pacific.
- MEDS. 1981. Oceanographic Data Transmitted from the Flemish Cap Area
September 1979 to December 1980.
- Institute of Oceanography, College of Science, National Taiwan University.
1976. Oceanographic Data of the Kuroshio Studies from Taiwan to Ishiga-
kijima.
- IOC. 1984. Indian Ocean: Collected Data on Primary Production, Phyto-
plankton, Pigments, and Some Related Factors.
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gations of the Tropical Atlantic.
- NODC. 1964. A Summary of Temperature-Salinity Characteristics of the
Persian Gulf, General Series.
- JODC. 1986. Data Report of KER: Kuroshio Exploitation and Utilization
Research.
- 국립수산진흥원. 해양조사연보.

제 2 절 해양자료 관리 System 사례조사 (미국 NODC)

미국 NODC는 해양자료의 입수, 관리, 배포를 위한 여러 기능을 다음과 같은 인력과 조직을 통해서 수행하고 있다.

NODC의 기능중 Data Base Management Division에 분류된 자료수집, 자료처리, 자료보관 등의 기능과 Information Services Division의 일부 기능으로 분류된 자료 가공과 서비스기능에 관하여 그 기능의 내용과 이를 지원하는 Software 등을 사례로서 검토한 바는 다음과 같다. 검토 내용중 비교란에는 기능별 Software와 업무 내용에 따라서 현재 KORDI의 현황이 기술되어 있다.

미국 해양자료센터 (NODC) 조직표



해양자료 관리 System 사례조사 (미국 NODC)

1. Data Base Management Division(총인력 : 35명)

가. Data Acquisition and management Branch(총인력 : 4명)

기 능 : 자료수집 및 정리

업 무 내 용	관련 소프트웨어	비 고
1. 자료입수(DDF) 2. DDF 검토		- ROSCOP양식 및 DDF를 수정 사용
3. Metadata 등의 자료 입력: Reference No., Country Code, Institute Code, Cruise id, etc.	- DB DataEase사용 . PC용 DBMS . 상업용	- DataEase, dBASE III, FoxBASE 등의 사용가능 - 나라, 연구기관, 선박 등의 Code체계 구축이 필요
4. 자료중복여부 검토 5. 자료 Format검토	- DB DINDB사용 . Data Inventory Data Base	
6. Format Conversion Program 작성 7. 자료취합	- Format Conversion 프로그램 - NODC Format으로 Format을 Conversion	- KORDI Format이 결정되면 Conversion 프로그램의 작성이 Case마다 필요 - 해양담당 인력수급이 필요

나. Data Processing Branch (총인력 : 11명)
 기 능 : 자료처리 및 QC(Quality Control)

업 무 내 용	관련 소프트웨어	비 고
1. Nansen Casting, C/STD Data Processing - System Processing flow는 [Fig.2-1]과 같음	- Station Data Processing System . 여러 Program으로 구성된 System . PL/1, Fortran, Cobol로 되어 있음 . Quality Check Program은 [Table 2-1]에 요약	- 현재 Network 형태로 구성된 Processing System은 없음. - 각 부서별 처리 프로그램은 존재하나 Quality Check상의 표준화 등은 설정되어 있지 않음 - 입수된 Source Program은 Data Processing System 구축에 활용이 클 것임
2. BT Data Processing - Analog Type Data 입수 - Digitization System을 통하여 Digital Data로 Diskette에 입력 - 동시에 Line Plotter로 Plot하여 Quality Check - 다음에 Host Computer에 Loading	- BT Data Processing System (XBTDIG) . XBT Digitization System . MS-DOS V2.19에서 만들어진 상업용 프로그램으로 구성 . C로 구성 . Quality Check Routine은 [Table 2-1]에 요약	- BT Data Processing System은 구축되어 있지 않음
3. MULDARS(Multidisciplinary Data Archive and Retrieval System) High Resolution C/STD Data Current, Pollutants, etc. - Station Data, BT Data를 제외한 Data의 Processing	- MULDARS(Multidisciplinary Data Archive and Retrieval System) . Quality Check Routine은 [Table 2-1]에 요약 . Data Inventory and Archive Branch 참조	- 각 분야별 프로그램은 존재하나 현재 Network 형태로 구축되어 있지 않음
4. Quality Assurance - 체계적이고 종합적인 Data처리 - Quality Check, Archival System	- QUA System . Common Data Dictionary(CDD) . Terminal Data Management System(TDMS)	- 유사한 Program이 Setup되어 있지 않음 - NODC QUA System Manual과 Source Program을 입수하였으므로 KORDI

업 무 내 용	관련 소프트웨어	비 고
<ul style="list-style-type: none"> - 특징 . Efficiency . User Oriented QA . Reduce Computer Related Tasks . Consistent Evaluation Criteria . File independent QC . Faster Throughput . Automated Mechanism - VAX 11/750과 PC대상으로 Design 	<ul style="list-style-type: none"> . Relational Data Base (RDB) . Fortran . Communication Software . 이 System의 Process Name은 [Table 2-2] 참조 	<ul style="list-style-type: none"> 에서 QUA System 개발시 참고 가능 - NODC의 QUA단점 . 'Integrated' Software로 Design되어 있지 않음 . Archive에서 다른 종류의 Host Computer (Univac)을 사용
<p>5. 문헌자료를 Physical Data로 변환</p> <ul style="list-style-type: none"> - Intelligent Scanning System 	<ul style="list-style-type: none"> - Scan Programming System . Fortran . 'STRIP', 'EDIT' Program . 'CONVSDL' Program . System Flow는 [Fig. 2-2] 참조 	<ul style="list-style-type: none"> - Scanning Program을 입수하였으며 추후 KORDI에서 Scan System을 구입. 활용시 많은 참고 가능 - Scan System의 문제점 . 완전한 Scan은 불가 . 원본에 큰 비중 . 한글 Scanning은 불가 . Conversion Program이 필요

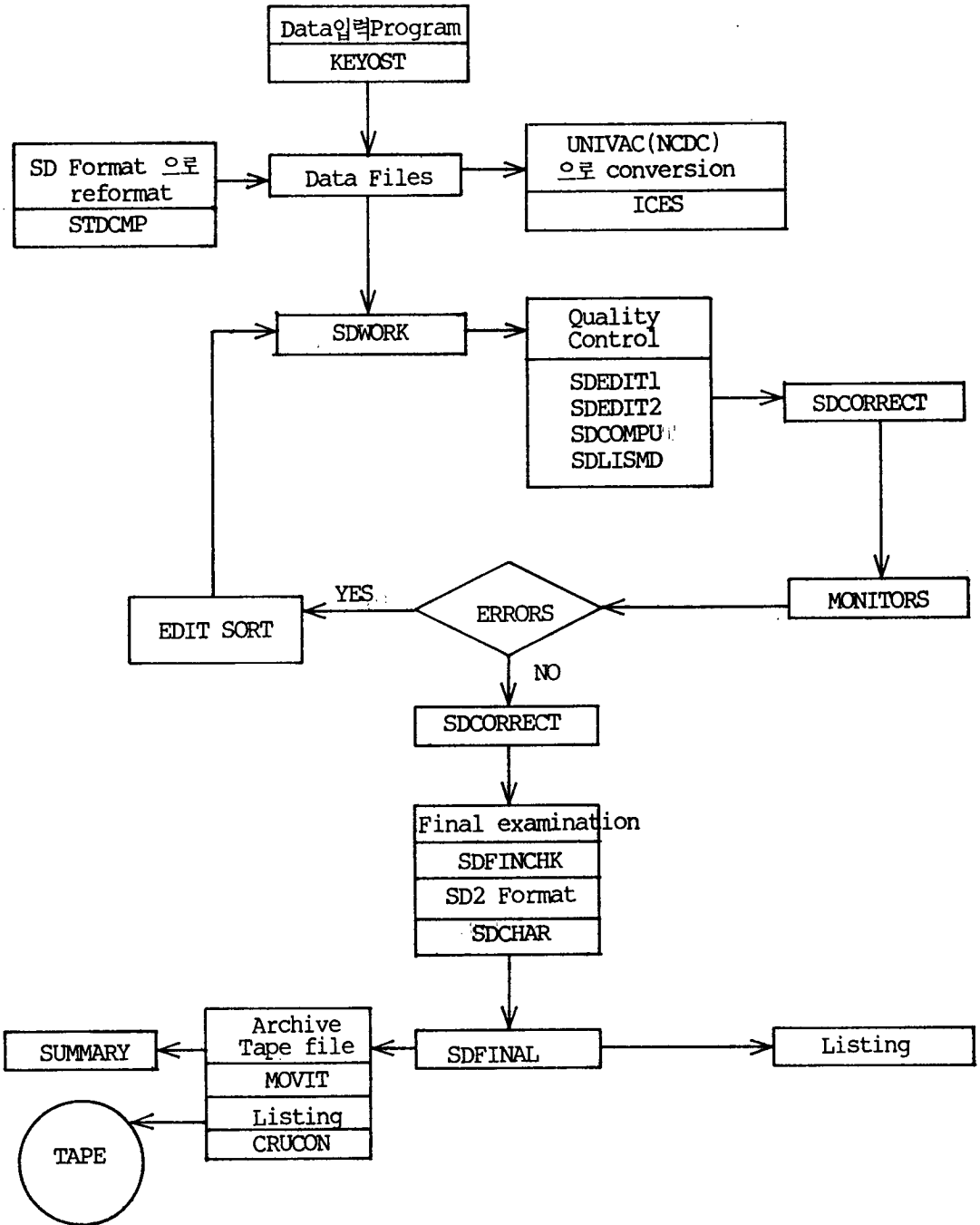


Fig. 2-1. NODC station data processing system.

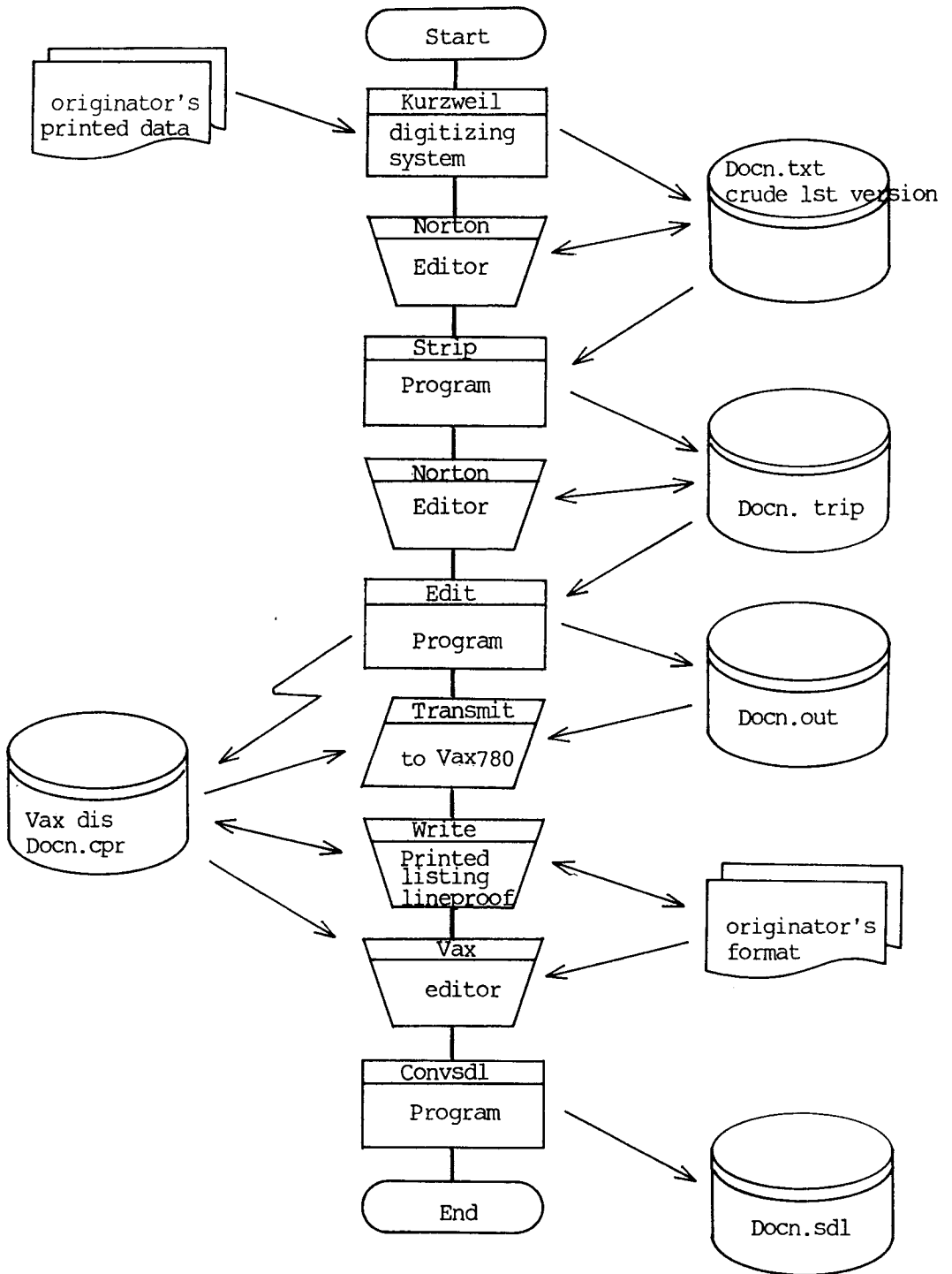


Fig. 2-2. NODC scan programming system.

Table 2-1. Data processing systems and quality check programs(NODC).

Data Processing Systems Names	Quality Check Program Names	Descriptions
Station Data Processing System	SDEDIT1	PL/1으로 짜여져 있으며, 각 Parameter 값의 범위를 Check하고 Monitor에 의해 Check될 수 있도록 Flag를 붙임
	SDEDIT2	PL/1으로 짜여져 있으며, Sigma-T Anomalies의 Output을 Check, Station 사이의 Speed를 계산하여 LAT-LON를 Check, 또한 모든 Chemistries의 Range를 Check
	SDCOMPU	PL/1으로 짜여져 있으며, Sigma-T, Sound Velocity, Dynamic Depth를 계산하기 위하여 Temperature, Salinity와 Oxygen에 대한 값들을 Standard Depths에서 Interpolation
	SDLISMD	FORTRAN으로 짜여져 있으며, Salinity-Density의 5° × 5° 격자 Model을 만들어 관측된 값들과 비교하여 Indicator Flag를 붙임
Bathythermograph Data Processing System	GILT(General Internal Logic Test)	<ul style="list-style-type: none"> - 관측지점간의 속도, 시간 및 거리의 당위성 - 선박속도 - Data Fields에 대한 범위의 당위성 - 관련 Data Fields 사이의 일관성 - 온도 및 수심의 검·교정의 당위성
	EOC(Environmental Quality Control)	- 같은 월 및 1° 간격에 대하여 Historical Data의 평균치와 비교
MULDARS(Multi-disciplinary Data Archive and Retrieval System)	MULCHECK	<ul style="list-style-type: none"> - Data Record들의 각 Field가 올바른 Data 형태인지 또는 모든 Field가 올바른 위치에 있는지를 확인하기 위하여 Data Dictionary와 비교 - Data 값들이 적절한 범위 내에 있는지 검토 - 사용된 모든 Codes 검증
	STATAX	<ul style="list-style-type: none"> - 모든 Taxonomic Code, 화학 Code검토 - 중복된 관측지점 번호 검토

Table 2-2. Quality Assurance System Process Names and Descriptions(NODC).

Process Names	Descriptions
ADDSETS	새로운 Data를 QUA Database에 첨가
ARCTAN	VAX로 부터 UNISYS로 Dataset를 Transfer
ASGDP	Data Processor를 Assign
CLEAN	QUA Work File들을 삭제
CODES	QUA Code Table을 Access
COPY DATA	많은 QUA Data Set들을 한 Tape로 Backup
DISC	Data Set의 QUA Processing을 중단
ERROR	QUA Error File을 Access
FORMAT	QUA File Format 정보를 Access
FVERIFY	Data Set의 Format을 검증
IVERIFY	Data Set을 Edit 또는 Display
PCTOVAX	PC로 부터 VAX로 Data Set을 Transfer
PREADD	새로운 Data를 QUA Database로 첨가하기 위한 Request를 Submit
PRECOPY	Data Set을 Tape로 Backup하기 위한 Request를 Submit
PREHIST	QUA Database로 부터 Data를 삭제하기 위한 Request를 Submit
RELAT	QUA Relationship Tables를 Access
RELDP	Data Processor를 Release
REPORT	QUA Tracking Database Information으로 부터 Report를 생성
PVERIFY	Data Set의 Relationship을 Verify
SUMDATA	NODC Archive를 위한 많은 Data Set들을 하나로 Summarize
VAXTOPC	VAX로 부터 PC로 Data Set을 Transfer

다. Data Inventory and Archives Branch (총인력 : 10명)

기 능 : 자료보관

업 무 내 용	관련 소프트웨어	비 고
<p>1. Data Inventory기능 - NODC의 Archive Data File에 대한 정보를 유지.관리</p> <p>2. Data Tracking기능 - NODC에 입수된 Data 가 Data Processing Cycle을 수행할 때까지 Data Set에 관한 정보를 유지.보관</p> <p>3. 이 System을 이용하여 Data 중복성 유무를 판단</p>	<p>- DINDB(Data Inventory Data Base) . System 2000 DBMS를 사용 . Hierarchical구조 . NCDC의 DAMUS Central Computer(Univac 1100/62)에 설치</p>	<p>- KORDI는 DBMS로 RDB, CDD, TDMS 등을 보유하고 있음 - KORDI의 DBMS인 RDB로 DB를 구축한 결과, . 기능, 성능면에서 부적합 - System 2000의 장점은 . 다량의 Data 이동이 용이 . 사용상 간편, 효율적 . Sequential과 Multiple Index Processing이 가능 . 다수의 Access Key . Report 작성능력 . Immediate Access가능 . Disk, Tape 등 보조 기억장치 사용 가능</p>
<p>4. MULDARS Dictionary를 관리 - MULDARS Database - Data의 Selective Retrieve - Data Inventory수행 - QC용 Information data 포함 - Archive Format용 정보포함</p>	<p>- MULDARS(Multidisciplinary Data Archive and Retrieval System) . Automated Dictionary System ..File Name, Code, Record Format, Parameter Table . QC ..File Type Record의 Parameter Table 이용</p>	<p>KORDI에는 이에 상당한 Program System이 없음</p>

2. Information Services Division (총인력 : 24명)

가. User Services Branch (총인력 : 9명)

기 능 : 사용자 서비스

업 무 내 용	관련 소프트웨어	비 고
1. Data Service - MULDARS의 Data Retrieval기능이용 2. 발간물 준비, 배포 - 정기적, 비정기적으로 Data보유현황, Service내용, 제공 가능한 Products의 형태 - Map의 발간, 배포 - 사용자 지침서, 발간물 공고 등	- MULDARS . Data Inventory and Archives Branch참조	KORDI에는 이와 유사한 기능의 System이 없음

나. Data Products Branch (총인력 : 4명)

기 능 : 자료가공

업 무 내 용	관련 소프트웨어	비 고
1. 자료가공 - 사용자 요구에 대한 Data Products 2. Data Inventory Products - Station Data Cruise, Parameter, BT Data Cruise, Station Location 3. Data Selection and Retrieval Products - File Format Data, Station Data, BT Data 4. Data 요약, 계산치, 통계분석치 5. 각종 Program의 개발 6. CD-ROM에 자료내장 - T-D, S-D Profiles (1900-1988) - 사용자에게 배부, 충족도와 성능검토중	- NARS(NODC Archive Retrieval System) . Fortran으로 구성 . Program Module ..NARS, NARSEL, NARSEX, NARSML, NARSCD, NARSCL, NARSFN - 사용자의 요구에 응할 수 있도록 응용 Program을 수시로 개발 활용 - CD-ROM 소프트웨어 ..상업용 ..Data Display/Access 소프트웨어	- NARS의 Source Program을 입수한 상태이므로 KORDI의 사용자 Service Format 구축시 활용가능 - NARS System의 Retrieve 방법 . By Geographic Area: Ocean SD, STD, BT, IGSS, . By Reference Number: Ocean SD, STD, BT, . By Track Number: MULDARS - CD-ROM을 입수하였고 기술정보실에 설치

해양관측자료의 제반 취급과정에 필요한 문헌, 프로그램 등의 입수현황은 아래와 같다.

< Reference, Manual >

- QUA Tracking, Processing Manual
- QUA Structure
- NODC's ADP Resource Manual
- DataEase Manual
- Intelligent Scanning System User's Manual
- XBT Digitizing Operating Instructions for the GTCO DIGI-PAD 5 Digitizer
- A Brief Introduction of ADCP Data Processing
- Archive Update System Introduction
- Inventory and Archives Handbook
- Narrative Description of the Event Cycle
- NODCHELP Library Description and Information
- TOGA(Tropical Ocean-Global Atmosphere) Processing System Chart
- User's Introduction and Guide to the JODA(Joint Environmental Data Analysis) Center
- Annual Report on Tropical Pacific Subsurface Thermal Structure - 1985, 1986, 1987
- NOSIE(NODC Ocean Science Information Exchange) List
- Station Data Processing Chart
- NODC Programs and Operations

< Diskette >

- NODC Institutions, Platform Codes
- NODC Data Formats Descriptions and Number Codes
- NODC Chemistry Codes
- ADCP Software
- Data Selection & Display Software for CD-ROM.NODC01
- DataEase (Reporting Software)
- NARS(NODC Archive Retrieval System)
- Intelligent Optical Scanning Error Check Program
- XBT Digitizer System Software
- Editor(QEDIT)
- PC Directory관리 (AUTOMENU)
- CD-ROM Demo Software(Geophysics of North America)
- NODCHELP Library Programs
- Information About ROSCOP and this Retrieval Program

< Magnetic Tape >

- QUA Programs
- TAXCODE
- Data Processing Programs FORTRAN Source (Tide)
- Data Processing Programs FORTRAN Source (Current)

< CD-ROM >

- Pacific Ocean Temperature - Salinity Profiles (1900-88)

< Source Programs List >

- TOGA Source Programs
- Data Processing programs FORTRAN Source (Tide)
- QUA Source Programs
- Station Data Processing Source Programs
- Archive Updata System Source Programs

제 3 절 해양자료 관리시스템 개발 현황 (KORDI)

1. 개 요

가. 자료의 소개파악

1980년부터 1983년까지 진해만 일대에서 관측된 해양물리분야 자료는 수온, 염분, 유속 및 유향, 조석, 바람, 염료방출 자료이고, 기타 수집된 자료로서는 국립수산진흥원의 자료와 기상자료가 있다.

이들 자료에 대한 야장과 관련 일지, 기록지 및 원시자료 중 일부는 수집이 가능하였으며, 원시자료중 자기기록테이프에 수록되어 있으나 Metadata의 식별에 필요한 머릿정보(Heading Information)가 분명치 않아서 정확하게 자료를 식별하기 어려운 자료가 많이 있었다. 야장에 수록되어 있는 자료 중에도 기록을 뒷받침하기 위한 보조정보의 누락이 많고 자료로서 구비해야 할 여건이 결여된 것이 있어서 자료발굴작업은 계속되어야 할 전망이다.

나. 입력을 위한 정보구성 및 양식조정

현재 NODC에서 사용하고 있는 PC용 DBMS인 "DATAEASE"를 활용하여 진해만 해양 관측자료 중 조석과 조류에 관한 Metadata(Background정보)의 입.출력용 양식(Form)을 Menu형식으로 CRT를 통해서 구성.완료하였으며, NODC의 자료저장 Format과 이 Metadata에 관한 정보를 검토.정리하여 D/B화 하고자 Test 중에 있다.

다. 자료의 정리, 입력 및 표준화

M/T에 각기 상이한 Heading으로 수록.산재되어 있는 자료의 출처를 관련기록물을 추적하여 확인.분류.정리중이며, 입수된 조석, 조류의 시계열 자료는 Disk에 저장되어 있고 별도로 M/T에 Backup되어 있으며, NODC의 Format으로 Conversion할 단계에 있다.

그러나 Format을 결정할 때 사용될 Code의 정리작업이 아직 미완상태로서 NODC에서 입수한 Data Formats Description Code, Number Code, Chemistry Code, Institutes Code, Platform Code, Taxonomic Code들을 분석.검토하여 Code체계가 결정되면 자료의 저장양식의 표준화는 바로 수행될 것이다.

라. 항목별 자료처리 및 검색과 출력자료의 정리 및 편찬준비

자료집 편찬은 자료의 표준화가 완료되면, 단계적으로 자료의 종류별로 D/B화 추진과 함께 진행될 예정이다.

2. 주요 개발내용

가. 자료수집

1980년부터 1983년까지 4년간 수행된 "진해만 적조 및 오염모니터링 시스템 개발을 위한 연구" 사업보고서를 검토.추적하여 다음과 같이 년도별 관측시기 및 위치를 파악할 수 있었다(Fig.1-1 - Fig.1-4, Table.1-1 - Table 1-3).

1차 조사에서는 해양물리연구실에 소장되어 있는 관련 M/T들을 검색.분류하여 이 사업에서 획득된 자료를 수집하였고, 2차 조사에서는 1차 조사에서 분류된 M/T에 저장된 Data파일들을 년도별 관측시기 및 위치를 조사, 관측정점의 자료여부를 확인한 후 파일들을 정리.서술하여 Disk에 년도별, 자료종류별로 저장하였다.

나. 입력양식의 구성

NODC에서 입수한 PC용 DBMS인 "DATAEASE"를 활용, Menu형식으로 Metadata의 입.출력을 위한 양식(Format)을 구성하였다(Fig.2-3, Fig.2-4, Fig.2-5, Fig.2-6).

다. 자료의 표준화

조석, 조류자료에 대하여 당소의 물리, 환경공학, 연안공학부서에서는 현재 상이한 Data Format을 사용하고 있는 바, 자료저장체계의 표준화를 위하여 진해만의 조석, 조류 자료는 미국 NODC의 Format을 채택하기로 결정하였고, 일차적으로 이들 자료들을 NODC Format으로 Conversion을 실시하였다(Table 2-3, Prog.2-1, Prog.2-2, Fig.2-7, Fig.2-8, Fig.2-9, Fig.2-10).

그리고 자료저장양식의 표준화에 적용할 코드체계 구축을 위하여 NODC의 분류 Code도 입수하였다.

- ① Data Formats Description and Number Code
- ② Chemistry Code
- ③ Institutes Code
- ④ Platform Code
- ⑤ Taxonomic Code

라. 추후 연구방향

- 1) ROSCOP양식 및 해양자료실로의 자료제출서식의 요건에 해당하는 정보를 구성.추가
- 2) 자료의 표준화
- 3) 자료처리 및 검색시스템 구축
- 4) 관측자료의 Inventory 작성
- 5) 자료집 편찬

Data Entry Information System
(Dataset Inventory - JH-TIDE)

Reference Number:

Country / Institute Code:

Country / Platform Code:

Platform Type:

Project Code:

Cruise Start Date: / /

Cruise End Date: / /

Comment:

Lat.:

Long.:

Dep. of Pressure:

Num. of Records:

Dep. of Bottom:

Time Interval:

Chinhae Tide Data Information List

Reference Number
Country / Institute Code
Country / Platform Code
Platform Type
Project Code
Cruise Start Date
Cruise Start Date2
Cruise Start Date3
Cruise End Date
Cruise End Date2
Cruise End Date3
Comment
Lat.
Long.
Dep. of Pressure
Num. of Records
Dep. of Bottom
Time Interval

Fig. 2-3.

Metadata I/O format for Tide Data.

Data Entry Information System
(Dataset Inventory - J-COMPONENTS)

Reference Number:

Country / Institute Code:

Country / Platform Code:

Platform Type:

Project Code:

Comment:

Lat.:

Long.:

Cruise Start Date: / /

Cruise End Date: / /

Dep. of Bottom:

Dep. of Current Meter:

Axis Rot.:

Num. of Records:

Location Name:

Time Interval:

Chinhae Tide Data Information List(COMPONENTS)

Reference Number

Country / Institute Code

Country / Platform Code

Platform Type

Project Code

Comment

Lat.

Long.

Cruise Start Date

Cruise Start Date2

Cruise Start Date3

Cruise End Date

Cruise End Date2

Cruise End Date3

Dep. of Bottom

Dep. of Current Mete

Axis Rot.

Num. of Records

Location Name

Time Interval

Fig. 2-4.

Metadata I/O Format of Current Data(Components).

Data Entry Information System
(Dataset Inventory - J-RESULTANTS)

Reference Number:

Country / Institute Code:

Country / Platform Code:

Platform Type:

Project Code:

Comment:

Cruise Start Date: / /

Cruise End Date: / /

Station Name:

Lat.:

Long.:

Sensor Depth:

Water Depth:

Time Interval:

Chinhae Tide Data Information list(RESULTANTS)

Reference Number

Country / Institute Code

Country / Platform Code

Platform Type

Project Code

Comment

Cruise Start Date

Cruise Start Date2

Cruise Start Date3

Cruise End Date

Cruise End Date2

Cruise End Date3

Station Name

Lat.

Long.

Sensor Depth

Water Depth

Time Interval

Fig. 2-5. Metadata I/O Format for Current Data (resultants).

Data Entry Information System
(Dataset Inventory - J-WIND)

Reference Number:

Country / Institute Code:

Country / Platform Code:

Platform Type:

Project Code:

Comment:

Cruise Start Date: / /

Cruise End Date: / /

Station Name:

Lat.:

Long.:

Sensor:

Time Interval:

Chinhae Wind Data Information List

Reference Number
Country / Institute Code
Country / Platform Code
Platform Type
Project Code
Comment
Cruise Start Date
Cruise Start Date2
Cruise Start Date3
Cruise End Date
Cruise End Date2
Cruise End Date3
Station Name
Lat.
Long.
Sensor
Time Interval

Fig. 2-6.

Metadata I/O Format for Wind Data.

Table 2-3.

Comparison of Tide Data Formats.

Parameter	구분	NODC	JODC	공학실	물리실
Information Block					
1. Gauge Number		v		v	v
2. Text		v	v	v	v
3. Sequence Number		v			
4. Latitude		v	v	v	
5. Longitude		v	v	v	
6. Dep. of Pressure Gauge		v	v	v	
7. No. of Detail Records		v		v	v
8. Dep. to Bottom		v			
9. Meter Usage Seq. No.		v			
10. Location Name		v	v	v	v
11. Observation Period			v	v	v
12. Apparatus			v	v	v
13. Reducing Scale			v		
14. Stipulated Limit			v		
15. 0 of Tide Gauge			v		
16. Total Depth				v	
17. Format				v	
18. Unit				v	
19. Data Interval				v	
1. Gauge Number		v			
2. Data		v	v		v
3. Time		v	v		v
4. Total Pressure		v	v		
5. Temperature		v			
6. Hourly Height of Tide			v		
7. Gauge Count				v	
8. Tide Data1				v	
9. Tide Data2				v	
10. Smoothed Component					v
11. Residual Component					v
12. Tidal Component					v
13. Sequence Number		v	v	v	v


```

C      PROGRAM TIDE-NODC-CONVERSIN
      IMPLICIT REAL*8 (A-H,O-Z)
      INTEGER*4 LOC(6)
      CHARACTER*6 STAT
      CHARACTER*20 TEXT
      CHARACTER*20 INFILE,OUTFILE
      CHARACTER*1 TEXTR/'1'/',MREC1/'2'/',MREC2/'3'/',DEPTREC/'4'/'
      INTEGER*4 GAUGE7NO,TOT7REC,DEPT7P

      TYPE 1
      FORMAT(' TYPE INPUT7FILE NAME : ',S)
      ACCEPT 2,INFILE
      TYPE 2
      FORMAT(A)
      TYPE 3
      FORMAT(' TYPE OUTPUT7FILE NAME : ',S)
      ACCEPT 2,OUTFILE

      OPEN(1,FILE=INFILE,STATUS='OLD')
      OPEN(2,FILE=OUTFILE,STATUS='NEW')
      OPEN(3,FILE='INFO.DAT',STATUS='OLD')

      ISEQ7NO=1
      READ(3,100,END=999)TEXT,GAUGE7NO,LOC,DEPT7P,TOT7REC,STAT
100    FORMAT(A,/,I5,/,I3,5I2,/,I5,/,I5,/,A)
999    CONTINUE

      WRITE(2,101)TEXT7F,GAUGE7NO,TEXT,ISEQ7NO,MREC1,GAUGE7NO,LOC(4),
1      LOC(5),LOC(6),'N',LOC(1),LOC(2),LOC(3),'E',DEPT7P,
1      TOT7REC,MREC2,GAUGE7NO,IDEPT7BOT,MSEQ7NO,NODC7USE,
1      STAT
101    FORMAT(9X,A,I5,A,I5,/,9X,A,I5,I2,I2,I2,A,I3,I2,I2,A,I5,I5,/,
1      9X,A,I5,I5,I3,I2,A6)

      ISEC=0
      ICNT=1

1000   CONTINUE
      READ(1,102,END=888)IYEAR,IMON,IDAY,IH,IRIN,TEP,PRE
102    FORMAT(2X,5I3,2F10.3)
      ITEP=JIDINT(TEP*1000.)
      IPRE=JIDINT(PRE*1000.)
      WRITE(2,103)DEPTREC,GAUGE7NO,IYEAR,IMON,IDAY,IH,IRIN,ISEC,
1      IPRE,ICNT,ITEP
103    FORMAT(9X,A,I5,6I2,I6,I5,I5)
      ICNT=ICNT+1
      GOTO 1000

888    CONTINUE
      STOP
      END

```

Program 2-1. Tide Data Format Conversion Program(from KORDI's Physical Oceanography Laboratory Format to NODC Format).

```

C      PROGRAM TIDE=NODC=CONVERSION
      IMPLICIT REAL*8 (A-H,O-Z)
      DIMENSION ISPCND(1000,10),ICOND(10000)
      DIMENSION LOC(6),INTND(6),LATND(6)
      CHARACTER*6 STAT
      CHARACTER*20 TEXT
      CHARACTER*20 INFILE,OUTFILE
      CHARACTER*1 TXTR/'1'//,HREC1/'2'//,HREC2/'3'//,DEPTREC/'4'//
      CHARACTER*4 NHT
      INTEGER*4 GAUGE#NO,TOT#REC

      TYPE 1
1      FORMAT(' TYPE INPUTFILE NAME : ',*)
      ACCEPT 2,INFILE
      TYPE 2
2      FORMAT(A)
      TYPE 3
3      FORMAT(' TYPE OUTPUTFILE NAME : ',*)
      ACCEPT 2,OUTFILE

      OPEN(1,FILE=INFILE,STATUS='OLD')
      OPEN(2,FILE=OUTFILE,STATUS='NEW')

100     READ(1,100)STAT,LOC,TEXT,GAUGE#NO,DEPT#P,TOT#REC,T#INT,INT#D
      FORMAT(//,1X,A6,/,2X,I3,5(3X,I2),/,A20,/,15,/,10X,F10.1,///,15,
1         /,F10.1,/,6I3,/)

      CNT=1
1000    CONTINUE
      READ(1,200,END=999)(ISPCND(CNT,I),I=1,10)
      CNT=CNT+1
      GOTO 1000
200     FORMAT(10I8)
999     CONTINUE
      CNT=CNT-1
      N=1
      ISECT#NO=1
      DO 111 J=1,CNT
      DO 111 I=1,10
      ICOND(I)=ISPCND(J,I)
      N=N+1
111     ENDDO

      WRITE(2,101)TXTR,GAUGE#NO,TEXT,ISECT#NO,HREC1,GAUGE#NO,LOC(4),
1         LOC(5),LOC(6),'E',LOC(1),LOC(2),LOC(3),'E',DEPT#P,
1         TOT#REC,HREC2,GAUGE#NO,IDEPT#NO,#SECT#NO,#UDC#USE,
1         STAT
101     FORMAT(9X,A,15,A,15,/,9X,A,15,I2,I2,I2,A,I3,I2,I2,A,F5.1,15,/,
1         9X,A,15,15,I3,I2,A6)

      DO 1001 I=1,TOT#REC
      TT=(I-1)*T#INT/60.
      CALL TCSE(INT#D,TT,LAT#D,NHT)
      WRITE(2,102)TOT#REC,GAUGE#NO,LAT#D,ICOND(I),I
102     FORMAT(9X,A,I5,6I2,I8,I5)
1001    CONTINUE
      STOP
      END

```

Program 2-2. Tide Data Format Conversion program(from KORDI's Coastal Engineering Laboratory Format to NODC Format).

```

SUBROUTINE TCSR(INTM,DVAL,LATH,NMT)
IMPLICIT REAL*8 (A-H,O-Z)
DIMENSION NOMON(12),LATH(6),INTM(6)
CHARACTER*4 NOMN(12),MNT
DATA NOMON/31,28,31,30,31,30,31,31,30,31,30,31/
DATA NOMN/'JAN.','FEB.','MAR.','APR.','MAY ','JUN.','
2      'JUL.','AUG.','SEP.','OCT.','NOV.','DEC.'/

IH=JIDINT(DVAL)
IDY=IH/24
IHR=IH-24*IDY
DHR=(DVAL-IH)*60.
IDN=JIDINT(DHR)

MN=IND+INTM(5)
IF(MN.GE.60) THEN
  MN=MN-60
  IHR=IHR+1
ENDIF
LATH(5)=MN

INT=IHR+INTM(4)
IF(INT.GE.24) THEN
  INT=INT-24
  IDY=IDY+1
ENDIF
LATH(4)=INT

IYT=INTM(1)
IYF=(IYT/4)*4
IF(IYD.NE.IYT) GOTO 333
IYH=(IYT/100)*100
IF(IYH.EQ.IYT) GOTO 333
NOMON(2)=29
333  CONTINUE

IDT=IDY+INTM(3)
ND=INTM(2)
DO WHILE(IDT.GT.NOMON(ND))
  IDT=IDT-NOMON(ND)
  ND=ND+1
  IF(ND.GT.12) THEN
    ND=ND-12
    IYT=IYT+1
    IYF=(IYT/4)*4
    IF(IYD.NE.IYT) GOTO 444
    IYH=(IYT/100)*100
    IF(IYH.EQ.IYT) GOTO 444
    NOMON(2)=29
444  CONTINUE
  ENDIF
ENDDO

LATH(3)=IDT
LATH(2)=ND
LATH(1)=IYT
NMT=NOMN(ND)
RETURN
END

```

Program 2- 2. Continued .

CYBER FORTRAN CODING FORM		PROGRAMMER (RSS/5/65.DAT)	PAGE	OF
LINE NO.	FORTRAN STATEMENT	DATE	CHECK	BY
02	5 3 15 20	31.977	-0.493	
03	5 3 15 30	16.601	0.801	
04	5 3 15 40	15.950	6.840	
05	5 3 15 50	16.100	0.790	
06	5 3 16 0	15.838	0.778	
07	5 3 16 10	16.062	0.762	
08	5 3 16 20	16.062	0.779	
09	5 3 16 30	16.062	0.771	
10	5 3 16 40	16.517	0.637	
11	5 3 16 50	16.175	0.650	
12	5 3 17 0	16.592	0.708	
13	5 3 17 10	16.628	0.764	
14	5 3 17 20	15.476	0.739	
15	5 3 17 30	16.137	0.746	
16	5 3 17 40	16.025	0.817	
17	5 3 17 50	16.925	0.872	
18	5 3 18 0	16.230	0.929	
19	5 3 18 10	16.326	0.984	
20	5 3 18 20	16.062	1.016	
21	5 3 18 30	16.062	1.107	
22	5 3 18 40	15.987	1.245	
23	5 3 18 50	15.950	1.201	
24	5 3 19 0	15.725	1.450	
25	5 3 19 10	15.669	1.469	
26	5 3 19 20	15.390	1.620	
27	5 3 19 30	15.502	1.677	
28	5 3 19 40	15.353	1.895	
29	5 3 19 50	15.516	1.871	
30	5 3 20 0	15.107	1.962	

Fig.2-7. Tide Data Format used in the Physical Oceanography Laboratory(KORDI).

UNIT: (5JK TID) MEGOH FOR

FORMER (SCS977&I.DAT)

FORM FOR TIDE GAUGE FORM

STATION NO: 127-31-7-36-45-29
 DATE: FEB 1969
 NAME: SCS 977 & I (1967)
 AREA: PACIFIC OCEAN
 SHEET: 148-5
 YEAR: 1969

(UNIT)
 (C)
 4757

0.0 0.0 0.0
 11.0
 29 7 30 19

: CONTEXT :
 : STATION :
 : LONGITUDE, LATITUDE :
 : INSTRUMENT :
 : SERIAL NO. OF INSTRUMENT :
 : TIDE GAUGE & HOORING DEPTH :
 : FORMAT OF RECORD :
 : UNIT :
 : TOTAL OF RECORD :
 : DATA INTERVAL (MIN.) :
 : TIME OF 1ST DATA :

22215	22100	22114	22064	22115	21669	21677	21593	21609	21555
21998	21671	21298	21929	21765	22019	22073	22142	22221	22500
22377	22467	22549	22082	22741	22844	22945	23046	23146	23247
23389	23493	23569	23074	23758	23841	23943	24039	24133	24242
24357	24482	24582	24326	24658	24748	24753	24791	24823	24842
24947	24947	24936	24837	24773	24715	24667	24599	24537	24455
24378	24271	24193	24082	23992	23879	23794	23701	23611	23514
23459	23360	23254	23153	23047	22979	22894	22817	22741	22666
22992	22891	22789	22692	22583	22532	22513	22495	22457	22295
22362	22353	22356	22359	22346	22316	22285	22255	22225	22192
22089	22063	22046	22030	22006	21984	21979	21974	21962	21948
21973	21947	21930	21915	21896	21873	21859	21846	21836	21829
21758	21731	21716	21701	21675	21655	21642	21630	21619	21609
22556	22493	22493	22471	22451	22424	22399	22373	22369	22346
22328	22301	22274	22258	22225	22194	22168	22158	22150	22136
22045	22023	22010	21994	21974	21958	21949	21936	21928	21923

Fig.2-9. Tide Data Format used in the Coastal Engineering Laboratory(KORDI).

CYBER FORTRAN CODING FORM				PROGRAMMER	SECTION NO.	PAGE	OF
DATE	TIME	BY	CHECK				
1	1995	BARBERA ALF-5					
2	1995	BARBERA ALF-5					
3	1995	0 0 05URCH0					
4	1995	7301210 0	22215				
4	1995	7301220 0	22100				
4	1995	7301230 0	22114				
4	1995	7301240 0	22660				
4	1995	7301250 0	22015				
4	1995	73013 0 0	21009				
4	1995	7301310 0	21927				
4	1995	7301320 0	21905				
4	1995	7301330 0	21500				
4	1995	7301340 0	21871				
4	1995	7301350 0	21805				
4	1995	73014 0 0	21929				
4	1995	7301410 0	21905				
4	1995	7301420 0	22019				
4	1995	7301430 0	22073				
4	1995	7301440 0	22142				
4	1995	7301450 0	22377				
4	1995	73015 0 0	22409				
4	1995	7301510 0	22500				
4	1995	7301520 0	22642				
4	1995	7301530 0	22741				
4	1995	7301540 0	22854				
4	1995	7301550 0	22945				
4	1995	73016 0 0	23946				
4	1995	7301610 0	23355				
4	1995	7301620 0	23063				
4	1995	7301630 0	23569				
4	1995	7301640 0	23674				
4	1995	7301650 0	23704				
4	1995	73017 0 0	23801				
4	1995	7301710 0	23905				
4	1995	7301720 0	24009				
4	1995	7301730 0	24367				
4	1995	7301740 0	24042				
4	1995	7301750 0	24525				
4	1995	73018 0 0	24591				

Fig.2-10. Tide Data Display according to NODC Format(Converted by Program 2-2).

제 3 장 해양조사보고(ROSCOP: Report of Observations / Samples Collected by Oceanographic programmes)

정부간 해양학위원회(IOC: Intergovernmental Oceanographic Commission)의 국제해양과학자료교환지침서(IOC 1976)에서 권장되고 사용되어 온 ROSCOP서식(제2판)에 따라서 진해만에서 1980-1983 기간중 관측된 해양물리 자료의 일부 자료를 정리, 보고한다. IOC는 제2판의 ROSCOP서식을 대폭적으로 바꾼 제3판 ROSCOP 서식을 소개하고 1991년 1월 1일자로 제3판 서식의 사용을 권장하고 있다. 그러나 본 사업에서는 이미 작성되었던 내용이므로 ROSCOP서식 제2판을 활용하였다.

ROSCOT 서식 제2판의 소개 및 작성방법은 해양연구소 연구보고서(남기수, 강해석 1988)에 상세하게 소개되어 있다.

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 1

A01 Expedition / Project: BSPE00022-43-7

A02 Ship or Platform: PAEKCHOHO Platform Type: 02

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): C.S. KIM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 120480

A08 General Ocean Areas: MASAN BAY, CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index $10^{\circ} \times 10^{\circ}$): 1312; 48,58

lat: N

long: E

Discipline	Type of Measurements	Number	Format
HP	H09	17	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 2
 A01 Expedition / Project: BSPE00022-43-7
 A02 Ship or Platform: PAEKCHOHO Platform Type: 02
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): C.S. KIM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 130480
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°): 1312: 48,58
 lat: N
 long: E

Discipline	Type of Measurements	Number	Format
HP	H09	7	1
D	D01	7	1

ROSCOP

(Report of Observations /
Samples Collected by Oceanographic Programme)
2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 3

A01 Expedition / Project: BSPE00022-43-7

A02 Ship or Platform: SUNCHANHO Platform Type: 02

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): C.S. KIM

A06 Names and Addresses of Organizations and Persons:
KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 280780 - 310780

A08 General Ocean Areas: CHINHAEBAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°): 1312; 48,58

lat: N

long: E

Discipline	Type of Measurements	Number	Format
HP	H09	15	1
D	D01	4	1, 7
	D09	1	7
	D90	56	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 4
 A01 Expedition / Project: BSPE00022-43-7
 A02 Ship or Platform: SUNCHANHO, KUWOLSANHO Platform Type: 02
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): C.S. KIM, Y.J. NO, P.S. PARK
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 310880 - 040980
 A08 General Ocean Areas: CHINHAEBAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°): 1312; 48,58
 lat: N
 long: E

Discipline	Type of Measurements	Number	Format
HP	H09	5	1
D	D01, D02	75	1, 7
	D09	2	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 5
 A01 Expedition / Project: BSPE00022-43-7
 A02 Ship or Platform: SUNCHANHO Platform Type: 02
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): K.S. NAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 260980 - 300980
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°): 1312; 48,58
 lat: N
 long: E

Discipline	Type of Measurements	Number	Format
HP	H09	27	1
D	D01, D02	41	1, 7
	D09	1	3

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 6

A01 Expedition / Project: BSPE00022-43-7

A02 Ship or Platform: SUNCHANHO Platform Type: 02

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): C.S. KIM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 031180 - 061180

A08 General Ocean Areas: CHINHAEBAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°): 1312: 48,58

lat: N

long: E

Discipline	Type of Measurements	Number	Format
HP	H09	25	1
D	D01, D02	33	1, 7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 7

A01 Expedition / Project: BSPE00031-56-7

A02 Ship or Platform: KYONGJINHO Platform Type: 02

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): P.S. PARK

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 260781 - 010881

A08 General Ocean Areas: MASAN BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°): 1312; 58

lat: N

long: E

Discipline	Type of Measurements	Number	Format
HP	H09	127	1
D	D01	127	1

ROSCOP

(Report of Observations /
Samples Collected by Oceanographic Programme)
2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 8
A01 Expedition / Project: BSPE00031-56-7
A02 Ship or Platform: HYUNDAEHO Platform Type: 02
A03 Country: KOREA
A04 Organization: KORDI
A05 Chief Scientist(s): K.S. NAM
A06 Names and Addresses of Organizations and Persons:
KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
A07 Date (DDMMYY): 270781
A08 General Ocean Areas: MASAN BAY
A09 Type(s) of Marine Zone(s): 02
A10 Geographic Area (Index $10^{\circ} \times 10^{\circ}$): 1312; 58
lat: N
long: E

Discipline	Type of Measurements	Number	Format
HP	H09	24	1
D	D01	24	1

ROSCOP

(Report of Observations /
Samples Collected by Oceanographic Programme)
2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 9
A01 Expedition / Project: BSPE00031-56-7
A02 Ship or Platform: SUNCHANHO Platform Type: 02
A03 Country: KOREA
A04 Organization: KORDI
'05 Chief Scientist(s): S.H. HAM
A06 Names and Addresses of Organizations and Persons:
KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
A07 Date (DDMMYY): 270781
A08 General Ocean Areas: MASAN BAY
A09 Type(s) of Marine Zone(s): 02
A10 Geographic Area (Index 10° ×10°): 1312; 58
lat: N
long: E

Discipline	Type of Measurements	Number	Format
HP	H09	25	1
D	D01	25	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 10
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or Platform: SUNGJINHO Platform Type: 02
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): K.S. NAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 280781
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°): 1312; 58
 lat: N
 long: E

Discipline	Type of Measurements	Number	Format
HP	H09	18	1
D	D01	18	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
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A00 Data Center: KORDI ODCSD Reference No.: 11
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or Platform: SUNCHANHO Platform Type: 02
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): C.S. KIM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 280781
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°): 1312; 58
 lat: N
 long: E

Discipline	Type of Measurements	Number	Format
HP	H09	30	1
D	D01	30	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 12

A01 Expedition / Project: BSPE00031-56-7

A02 Ship or Platform: SUNCHANHO Platform Type: 02

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): C.S. KIM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 300781

A08 General Ocean Areas: MASAN BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°): 1312; 58

lat: N

long: E

Discipline	Type of Measurements	Number	Format
HP	H09	36	1
D	D01	36	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 13
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or Platform: HYUNDAEHO Platform Type: 02
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): K.S. NAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 300781
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°): 1312: 58
 lat: N
 long: E

Discipline	Type of Measurements	Number	Format
HP	H09	23	1
D	D01	23	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 14

A01 Expedition / Project: BSPE00031-56-7

A02 Ship or Platform: SUNCHANHO Platform Type: 02

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 240981

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°): 1312; 58

lat: N

long: E

Discipline	Type of Measurements	Number	Format
HP	H09	14	1
D	D01	14	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 15
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or Platform: SUNCHANHO Platform Type: 02
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 260981
 A08 General Ocean Areas: CHINHAEBAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°): 1312; 58
 lat: N
 long: E

Discipline	Type of Measurements	Number	Format
HP	H09	23	1
D	D01	23	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 16
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or Platform: INCHON-801 Platform Type: 01
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): K.S. NAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 260981 - 270981
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°): 1312; 58
 lat: 350329N
 long: 1283914E

Discipline	Type of Measurements	Number	Format
HP	H09	13	1
D	D01	13	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 17
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or Platform: SUNCHANHO Platform Type: 02
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 280981
 A08 General Ocean Areas: CHINHAEB BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°): 1312; 58
 lat: N
 long: E

Discipline	Type of Measurements	Number	Format
HP	H09	24	1
D	D01	24	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 18
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or Platform: INCHON-801 Platform Type: 01
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): K.S. NAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 240981
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°): 1312; 58
 lat: N
 long: E

Discipline	Type of Measurements	Number	Format
HP	H09	16	1
D	D01	16	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 19
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or Platform: INCHON-801 Platform Type: 01
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): K.S. NAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 260981
 A08 General Ocean Areas: CHINHAEBAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°): 1312; 58
 lat: N
 long: E

Discipline	Type of Measurements	Number	Format
HP	H09	24	1
D	D01	24	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 20

A01 Expedition / Project: BSPE00031-56-7

A02 Ship or Platform: INCHON-801 Platform Type: 01

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): K.S. NAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 280981

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°): 1312; 58

lat: N

long: E

Discipline	Type of Measurements	Number	Format
HP	H09	24	1
D	D01	24	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 21

A01 Expedition / Project: BSPE00031-56-7

A02 Ship or Platform: KYONGJINHO Platform Type: 02

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): P.S. PARK

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 240981

A08 General Ocean Areas: CHINHAEBAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°): 1312; 58

lat: N

long: E

Discipline	Type of Measurements	Number	Format
HP	H09	7	1
D	D01	7	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 22

A01 Expedition / Project: BSPE00031-56-7

A02 Ship or Platform: KYONGJINHO Platform Type: 02

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): P.S. PARK

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 260981

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°): 1312; 58

lat: N

long: E

Discipline	Type of Measurements	Number	Format
HP	H09	15	1
D	D01	15	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 23
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or Platform: KYONGJINHO Platform Type: 02
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): P.S. PARK
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 280981
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°): 1312; 58
 lat: N
 long: E

Discipline	Type of Measurements	Number	Format
HP	H09	11	1
D	D01	11	1

ROSCOP

(Report of Observations /
Samples Collected by Oceanographic Programme)
2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 24
A01 Expedition / Project: BSPE00031-56-7
A02 Ship or Platform: Platform Type: 08
A03 Country: KOREA
A04 Organization: KORDI
A05 Chief Scientist(s): S.H. HAM
A06 Names and Addresses of Organizations and Persons:
KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
A07 Date (DDMMYY): 240781 - 290781
A08 General Ocean Areas: MASAN BAY
A09 Type(s) of Marine Zone(s): 02
A10 Geographic Area (Index 10° ×10°):
lat: 351224N
long: 1273524E

Discipline	Type of Measurements	Number	Format
D	D09	5	1

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 25
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 290781
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°):
 lat: 351224N
 long: 1273524E

Discipline	Type of Measurements	Number	Format
D	D09	1	7

ROSCOP

(Report of Observations /
Samples Collected by Oceanographic Programme)
2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 26
A01 Expedition / Project: BSPE00031-56-7
A02 Ship or platform: - Platform Type: 08
A03 Country: KOREA
A04 Organization: KORDI
A05 Chief Scientist(s): S.H. HAM
A06 Names and Addresses of Organizations and Persons:
KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
A07 Date (DDMMYY): 010881 - 040981
A08 General Ocean Areas: MASAN BAY
A09 Type(s) of Marine Zone(s): 02
A10 Geographic Area (Index 10° × 10°):
lat: 351224N
long: 1273524E

Discipline	Type of Measurements	Number	Format
D	D09	35	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 27

A01 Expedition / Project: BSPE00031-56-7

A02 Ship or platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 040981 - 230981

A08 General Ocean Areas: MASAN BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°):
 lat: 351224N
 long: 1273524E

Discipline	Type of Measurements	Number	Format
D	D09	19	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 28
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 230981 - 290981
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 351224N
 long: 1273524E

Discipline	Type of Measurements	Number	Format
D	D09	6	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 29
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 290981 - 101181
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°):
 lat: 351224N
 long: 1273524E

Discipline	Type of Measurements	Number	Format
D	D09	43	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 30
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 240781 - 010881
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 351032N
 long: 1273510E

Discipline	Type of Measurements	Number	Format
D	D09	8	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 31

A01 Expedition / Project: BSPE00031-56-7

A02 Ship or platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:

KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 240781 - 010881

A08 General Ocean Areas: MASAN BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):

lat: 350351N

long: 1283756E

Discipline	Type of Measurements	Number	Format
D	D09	8	7

ROSCOP

(Report of Observations /
Samples Collected by Oceanographic Programme)
2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 32

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 080382 - 100382

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
lat: 350400N
long: 1283812E

Discipline	Type of Measurements	Number	Format
D	D09	2	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 33

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:

KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 080382 - 100382

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):

lat: 350053N

long: 1283014E

Discipline	Type of Measurements	Number	Format
D	D09	2	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 34
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 100382 - 260382
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°):
 lat: 350053N
 long: 1283014E

Discipline	Type of Measurements	Number	Format
D	D09	16	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 35
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 100382 - 260382
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 350254N
 long: 1283344E

Discipline	Type of Measurements	Number	Format
D	D09	16	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODGSD Reference No.: 36

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 160582 - 150682

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°):
 lat: 350811N
 long: 1283633E

Discipline	Type of Measurements	Number	Format
D	D09	30	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 37
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 150682 - 160782
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°):
 lat: 350811N
 long: 1283633E

Discipline	Type of Measurements	Number	Format
D	D09	31	7

ROSCOP

(Report of Observations /
Samples Collected by Oceanographic Programme)
2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 38
A01 Expedition / Project: BSPE00044-66-7
A02 Ship or Platform: - Platform Type: 08
A03 Country: KOREA
A04 Organization: KORDI
A05 Chief Scientist(s): S.H. HAM
A06 Names and Addresses of Organizations and Persons:
KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
A07 Date (DDMMYY): 150782 - 200882
A08 General Ocean Areas: CHINHAE BAY
A09 Type(s) of Marine Zone(s): 02
A10 Geographic Area (Index $10^{\circ} \times 10^{\circ}$):
lat: 350811N
long: 1283633E

Discipline	Type of Measurements	Number	Format
D	D09	36	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 39

A01 Expedition / Project: BSPE00048-80-7

A02 Ship or Platform: Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 170283 - 300383

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°):
 lat: 345300N
 long: 1282820E

Discipline	Type of Measurements	Number	Format
D	D09	41	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 40

A01 Expedition / Project: RSPE00048-80-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 180283 - 310383

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
 lat: 350430N
 long: 1284720E

Discipline	Type of Measurements	Number	Format
D	D09	41	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 41

A01 Expedition / Project: BSPE00048-80-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 180283 - 300383

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°):
 lat: 350300N
 long: 1284000E

Discipline	Type of Measurements	Number	Format
D	D09	40	7

ROSCOP

(Report of Observations /
Samples Collected by Oceanographic Programme)
2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 42
A01 Expedition / Project: BSPE00048-80-7
A02 Ship or Platform: - Platform Type: 08
A03 Country: KOREA
A04 Organization: KORDI
A05 Chief Scientist(s): S.H. HAM
A06 Names and Addresses of Organizations and Persons:
KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
A07 Date (DDMMYY): 210283 - 300383
A08 General Ocean Areas: CHINHAE BAY
A09 Type(s) of Marine Zone(s): 02
A10 Geographic Area (Index 10° ×10°):
lat: 345915N
long: 1284940E

Discipline	Type of Measurements	Number	Format
D	D09	37	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 43

A01 Expedition / Project: RSPE00048-80-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:

KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 210283 - 310383

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°):

lat: 345645N

long: 1284340E

Discipline	Type of Measurements	Number	Format
D	D09	38	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 44
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 250781 - 010881
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 350819N
 long: 1283606E

Discipline	Type of Measurements	Number	Format
D	D02	7	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 45
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 250781 - 010881
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 350819N
 long: 1283606E

Discipline	Type of Measurements	Number	Format
D	D02	7	7

R O S C O P

(Report of Observations /
Samples Collected by Oceanographic Programme)
2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 46

A01 Expedition / Project: BSPE00031-56-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 260781 - 010881

A08 General Ocean Areas: MASAN BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°):
lat: 350818N
long: 1283617E

Discipline	Type of Measurements	Number	Format
D	D02	6	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 47

A01 Expedition / Project: BSPE00031-56-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 260781 - 010881

A08 General Ocean Areas: MASAN BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
 lat: 350818N
 long: 1283617E

Discipline	Type of Measurements	Number	Format
D	DO2	6	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 48
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 260781 - 010881
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 350818N
 long: 1283617E

Discipline	Type of Measurements	Number	Format
D	D02	6	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 49

A01 Expedition / Project: BSPE00031-56-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 250781 - 010881

A08 General Ocean Areas: MASAN BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
 lat: 350818N
 long: 1283628E

Discipline	Type of Measurements	Number	Format
D	D02	7	7

ROSCOP

(Report of Observations /
Samples Collected by Oceanographic Programme)
2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 50

A01 Expedition / Project: BSPE00031-56-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 250781 - 010881

A08 General Ocean Areas: MASAN BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
lat: 350818N
long: 1283628E

Discipline	Type of Measurements	Number	Format
D	DO2	7	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 51
 A01 Expedition / Project: BSPE00031-56-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 230981 - 290981
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 350329N
 long: 1283914E

Discipline	Type of Measurements	Number	Format
D	D02	6	7

ROSCOP

(Report of Observations /
Samples Collected by Oceanographic Programme)
2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 52
A01 Expedition / Project: BSPE00031-56-7
A02 Ship or Platform: - Platform Type: 08
A03 Country: KOREA
A04 Organization: KORDI
A05 Chief Scientist(s): S.H. HAM
A06 Names and Addresses of Organizations and Persons:
KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
A07 Date (DDMMYY): 230981 - 240981
A08 General Ocean Areas: CHINHAEBAY
A09 Type(s) of Marine Zone(s): 02
A10 Geographic Area (Index 10° × 10°):
lat: 350242N
long: 1284034E

Discipline	Type of Measurements	Number	Format
D	DO2	1	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 53

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:

KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 080382 - 260382

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°):

lat: 350128N

long: 1283044E

Discipline	Type of Measurements	Number	Format
D	DO2	18	7

ROSCOP

(Report of Observations /
Samples Collected by Oceanographic Programme)
2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 54
A01 Expedition / Project: BSPE00044-66-7
A02 Ship or Platform: Platform Type: 08
A03 Country: KOREA .
A04 Organization: KORDI
A05 Chief Scientist(s): S.H. HAM
A06 Names and Addresses of Organizations and Persons:
KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
A07 Date (DDMMYY): 080382 - 260382
A08 General Ocean Areas: CHINHAE BAY
A09 Type(s) of Marine Zone(s): 02
A10 Geographic Area (Index 10° × 10°):
lat: 350128N
long: 1283044E

Discipline	Type of Measurements	Number	Format
D	D02	18	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 55

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 080382 - 260382

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°):
 lat: 350223N
 long: 1283246E

Discipline	Type of Measurements	Number	Format
D	D02	18	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 56
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 080382 - 260382
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°):
 lat: 350223N
 long: 1283246E

Discipline	Type of Measurements	Number	Format
D	D02	18	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 57

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 170582 - 150682

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
 lat: 350200N
 long: 1284600E

Discipline	Type of Measurements	Number	Format
D	DO2	29	7

R O S C O P

(Report of Observations /
Samples Collected by Oceanographic Programme)
2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 58

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 150682 - 150782

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
lat: 350200N
long: 1284600E

Discipline	Type of Measurements	Number	Format
D	D02	30	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 59
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 150782 - 060882
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°):
 lat: 350200N
 long: 1284600E

Discipline	Type of Measurements	Number	Format
D	D02	22	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 60
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 170582 - 150682
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 350200N
 long: 1284600E

Discipline	Type of Measurements	Number	Format
D	D02	29	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 61

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 150682 150782

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
 lat: 350200N
 long: 1284600E

Discipline	Type of Measurements	Number	Format
D	D02	30	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 62
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 150782 - 170882
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 350200N
 long: 1284600E

Discipline	Type of Measurements	Number	Format
D	D02	33	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 63

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 160582 - 230582

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
 lat: 350350N
 long: 1284106E

Discipline	Type of Measurements	Number	Format
D	D02	7	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 64

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 160582 - 150682

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°):
 lat: 350350N
 long: 1284106E

Discipline	Type of Measurements	Number	Format
D	D02	30	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 65

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:

KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 170582 - 150682

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°):

lat: 350600N

long: 1283748E

Discipline	Type of Measurements	Number	Format
D	DO2	29	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 66

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 150682 - 150782

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
 lat: 350600N
 long: 1283748E

Discipline	Type of Measurements	Number	Format
D	D02	30	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 67
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 150782 - 170882
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°):
 lat: 350600N
 long: 1283748E

Discipline	Type of Measurements	Number	Format
D	DO2	33	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 68
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 170582 - 150682
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 350600N
 long: 1283748E

Discipline	Type of Measurements	Number	Format
D	D02	29	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 69
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 150782 · 170882
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 350600N
 long: 1283748E

Discipline	Type of Measurements	Number	Format
D	D02	33	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 70

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 160582 - 230582

A08 General Ocean Areas: MASAN BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°):
 lat: 350805N
 long: 1283619E

Discipline	Type of Measurements	Number	Format
D	D02	7	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 71

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 160582 - 230582

A08 General Ocean Areas: MASAN BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
 lat: 350805N
 long: 1283619E

Discipline	Type of Measurements	Number	Format
D	D02	7	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 72

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 160582 - 230582

A08 General Ocean Areas: MASAN BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
 lat: 350805N
 long: 1283619E

Discipline	Type of Measurements	Number	Format
D	D02	7	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 73
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 230582 - 150682
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 350800N
 long: 1283628E

Discipline	Type of Measurements	Number	Format
D	D02	23	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 74
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 150682 - 150782
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 350800N
 long: 1283628E

Discipline	Type of Measurements	Number	Format
D	D02	30	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 75
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 150782 - 170882
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°):
 lat: 350800N
 long: 1283628E

Discipline	Type of Measurements	Number	Format
D	D02	33	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 76
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 230582 - 150682
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° × 10°):
 lat: 350800N
 long: 1283628E

Discipline	Type of Measurements	Number	Format
D	D02	23	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 77

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 150682 - 150782

A08 General Ocean Areas: MASAN BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
 lat: 350800N
 long: 1283628E

Discipline	Type of Measurements	Number	Format
D	D02	30	7

ROSCOP

(Report of Observations /
Samples Collected by Oceanographic Programme)
2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 78
A01 Expedition / Project: BSPE00044-66-7
A02 Ship or Platform: - Platform Type: 08
A03 Country: KOREA
A04 Organization: KORDI
A05 Chief Scientist(s): S.H. HAM
A06 Names and Addresses of Organizations and Persons:
KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
A07 Date (DDMMYY): 150782 - 170882
A08 General Ocean Areas: MASAN BAY
A09 Type(s) of Marine Zone(s): 02
A10 Geographic Area (Index 10° ×10°):
lat: 350800N
long: 1283628E

Discipline	Type of Measurements	Number	Format
D	D02	33	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 79

A01 Expedition / Project: BSPE00044-66-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 230582 - 110682

A08 General Ocean Areas: MASAN BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°):
 lat: 350800N
 long: 1283628E

Discipline	Type of Measurements	Number	Format
D	D02	19	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 80
 A01 Expedition / Project: BSPE00044-66-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 150782 - 170882
 A08 General Ocean Areas: MASAN BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 350800N
 long: 1283628E

Discipline	Type of Measurements	Number	Format
D	D02	33	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 81

A01 Expedition / Project: BSPE00048-80-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 200283 - 300383

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
 lat: 350155N
 long: 1283144E

Discipline	Type of Measurements	Number	Format
D	002	38	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 82

A01 Expedition / Project: BSPE00048-80-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 200283 - 300383

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° × 10°):
 lat: 350155N
 long: 1283144E

Discipline	Type of Measurements	Number	Format
D	D02	38	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 83
 A01 Expedition / Project: BSPE00048-80-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 200283 - 300383
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 345900N
 long: 1283115E

Discipline	Type of Measurements	Number	Format
D	D02	38	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 84
 A01 Expedition / Project: BSPE00048-80-7
 A02 Ship or Platform: - Platform Type: 08
 A03 Country: KOREA
 A04 Organization: KORDI
 A05 Chief Scientist(s): S.H. HAM
 A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA
 A07 Date (DDMMYY): 200283 - 300383
 A08 General Ocean Areas: CHINHAE BAY
 A09 Type(s) of Marine Zone(s): 02
 A10 Geographic Area (Index 10° ×10°):
 lat: 345900N
 long: 1283115E

Discipline	Type of Measurements	Number	Format
D	D02	38	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 85

A01 Expedition / Project: BSPE00048-80-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 200283 - 300383

A08 General Ocean Areas: CHINHAE BAY

A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
 lat: 345815N
 long: 1283330E

Discipline	Type of Measurements	Number	Format
D	D02	38	7

R O S C O P
 (Report of Observations /
 Samples Collected by Oceanographic Programme)
 2nd Ed.

A00 Data Center: KORDI ODCSD Reference No.: 86

A01 Expedition / Project: BSPE00031-56-7

A02 Ship or Platform: - Platform Type: 08

A03 Country: KOREA

A04 Organization: KORDI

A05 Chief Scientist(s): S.H. HAM

A06 Names and Addresses of Organizations and Persons:
 KORDI(K.S. NAM), ANSAN P.O.BOX 29, SEOUL 425-600, KOREA

A07 Date (DDMMYY): 040981 - 290981

A08 General Ocean Areas: MASAN BAY

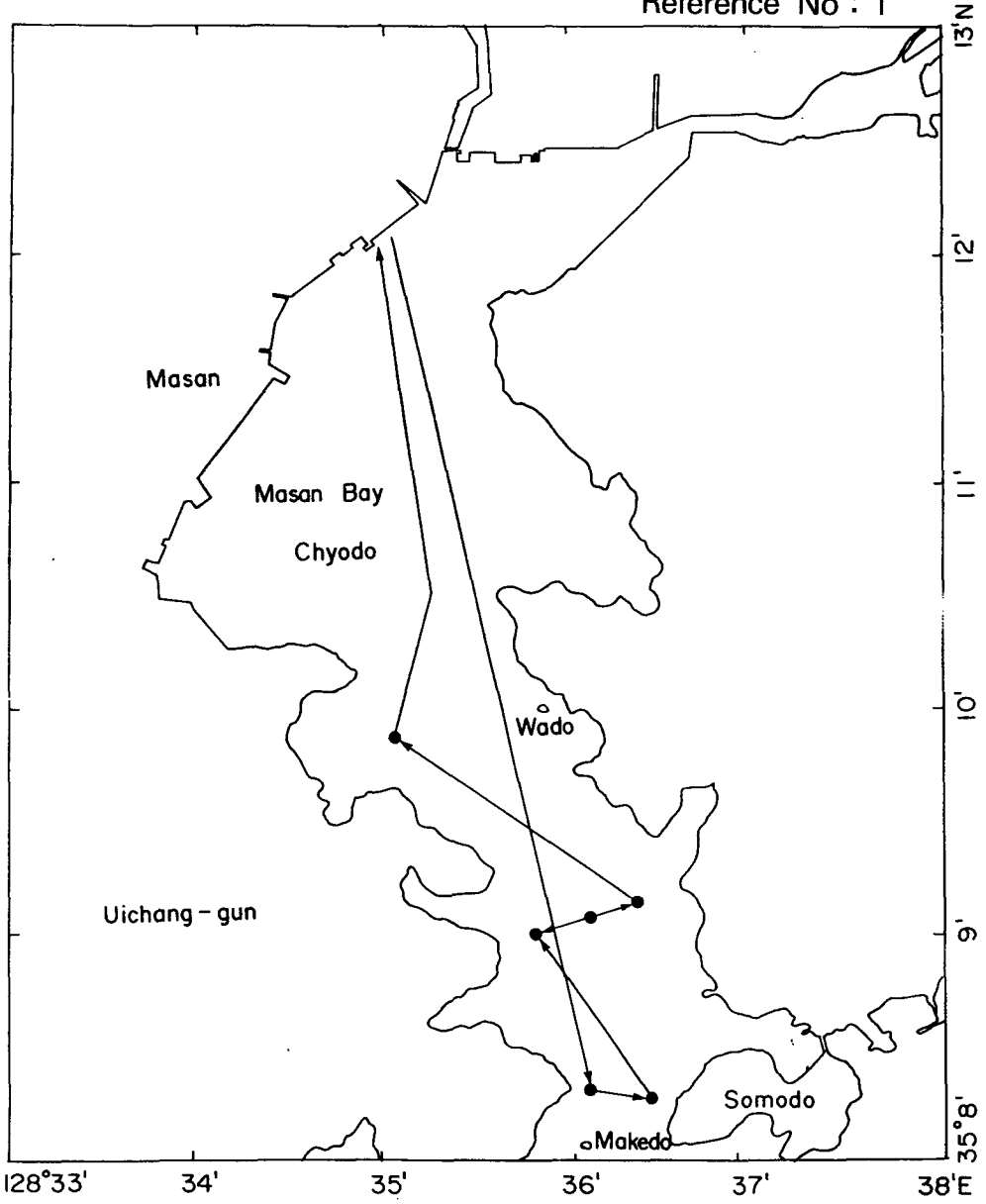
A09 Type(s) of Marine Zone(s): 02

A10 Geographic Area (Index 10° ×10°):
 lat: 350351N
 long: 1283756E

Discipline	Type of Measurements	Number	Format
D	D09	25	7

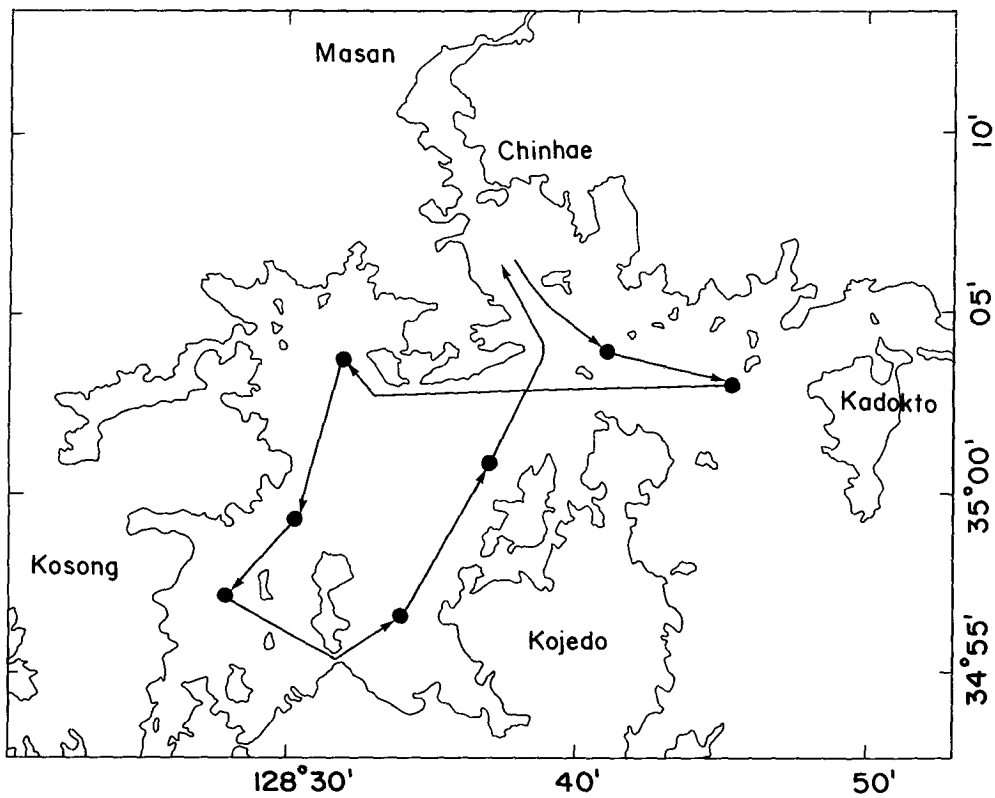
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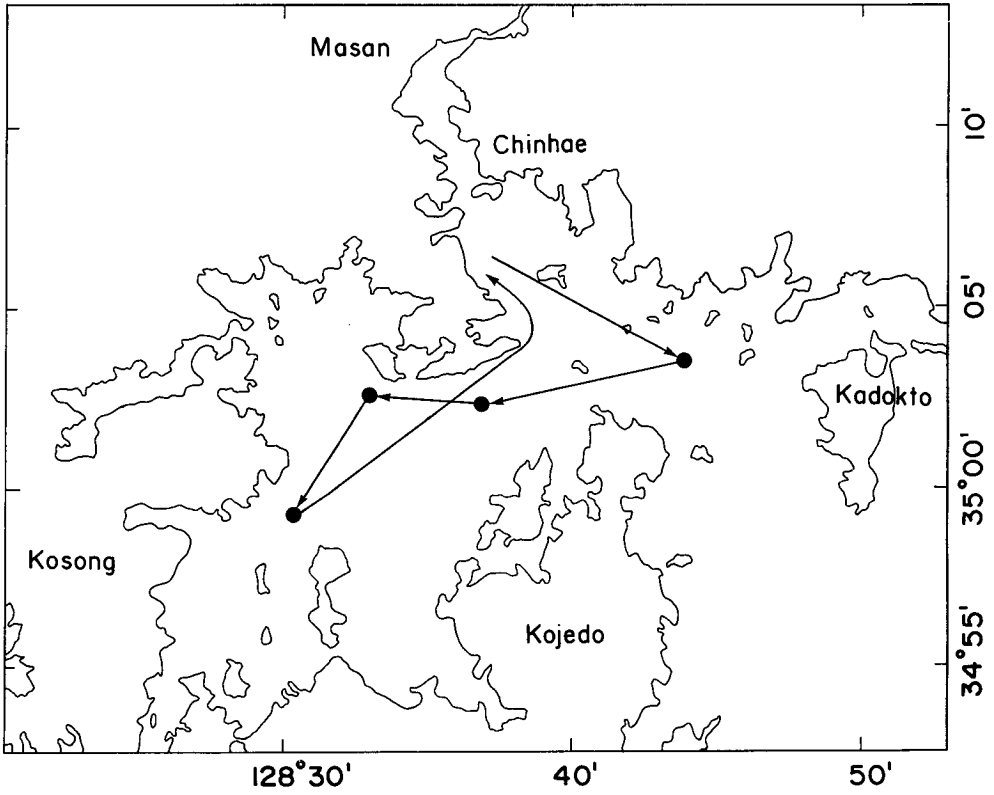
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Reference No : 2



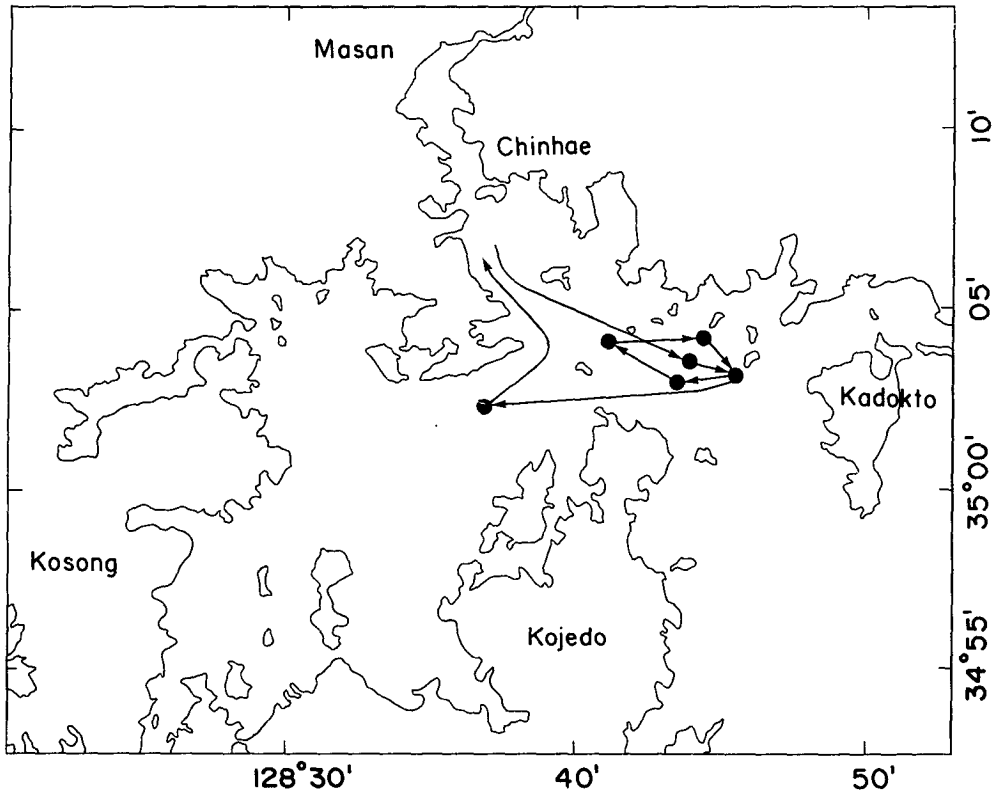
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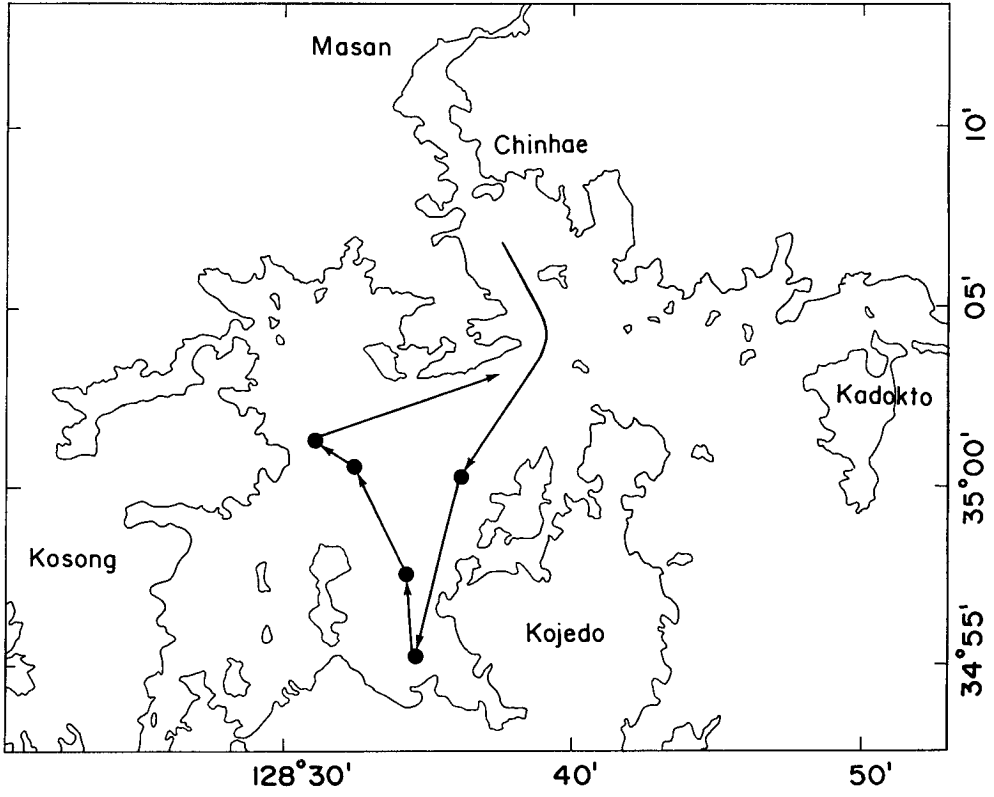
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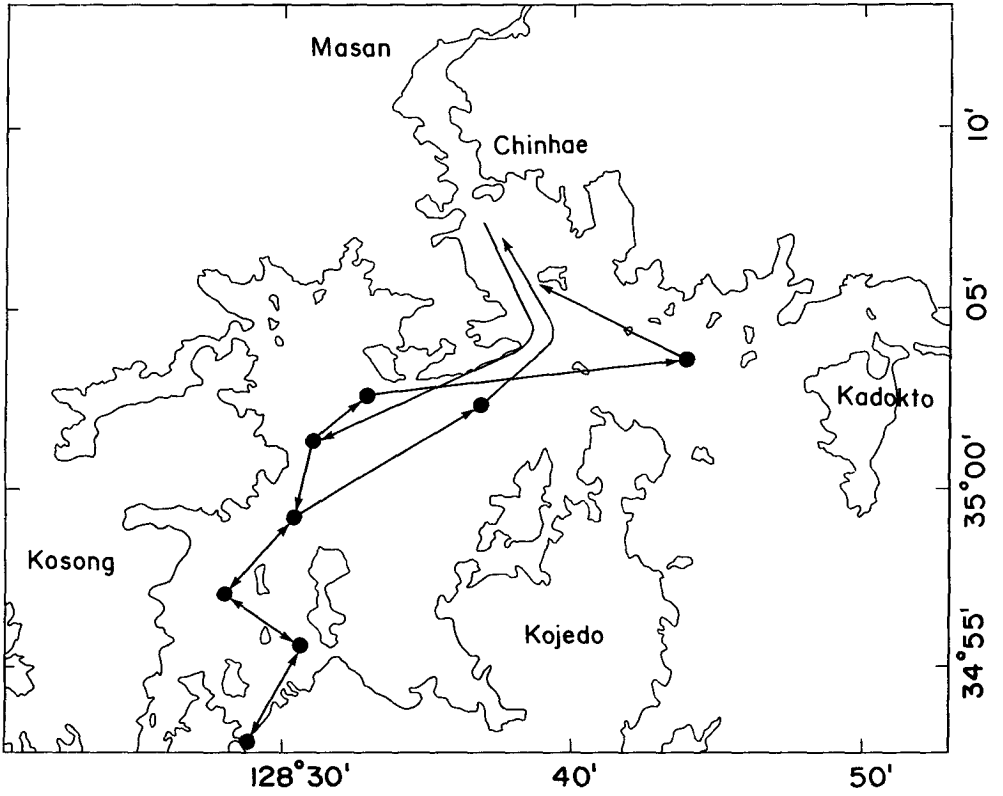
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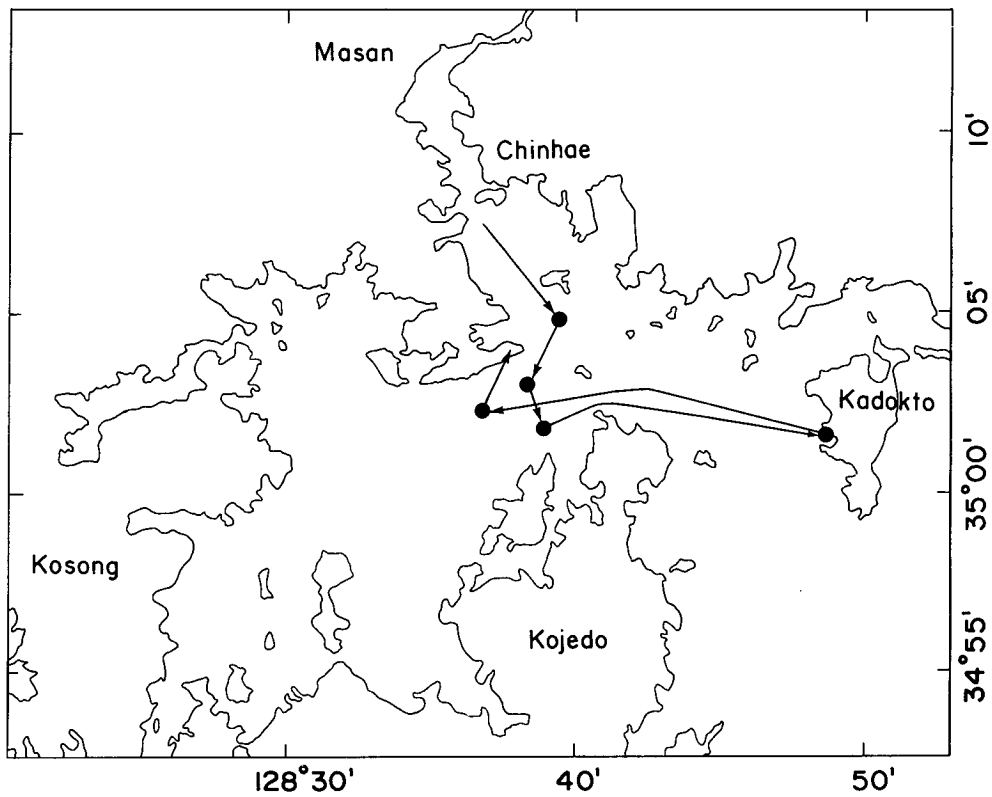
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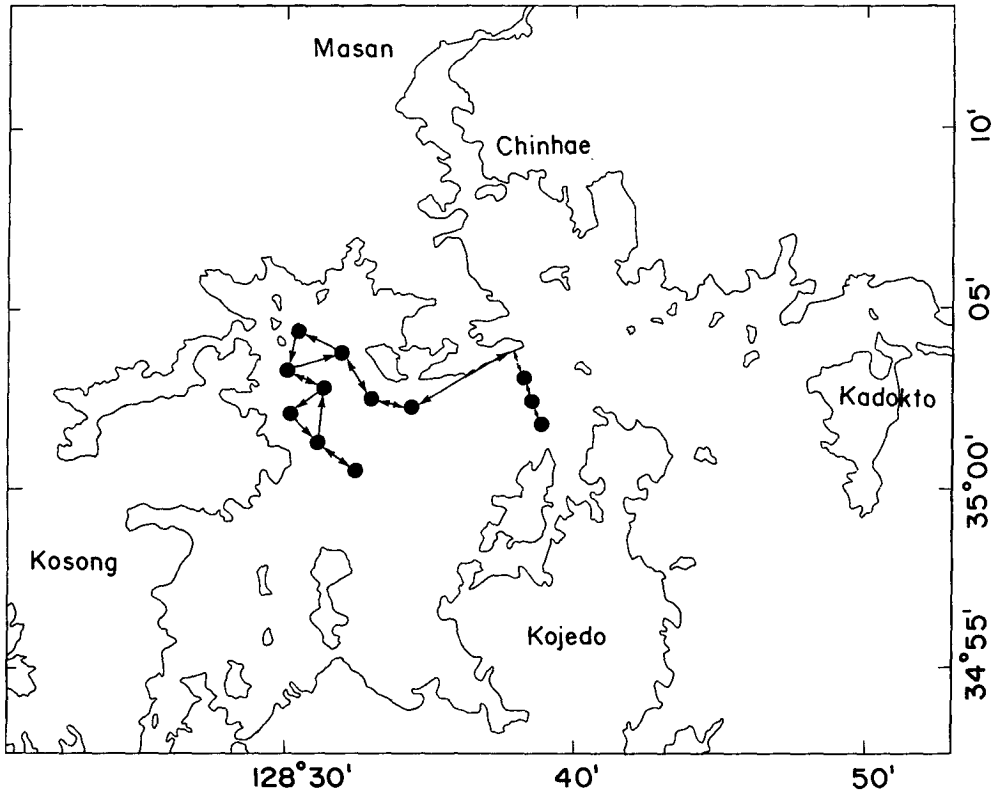
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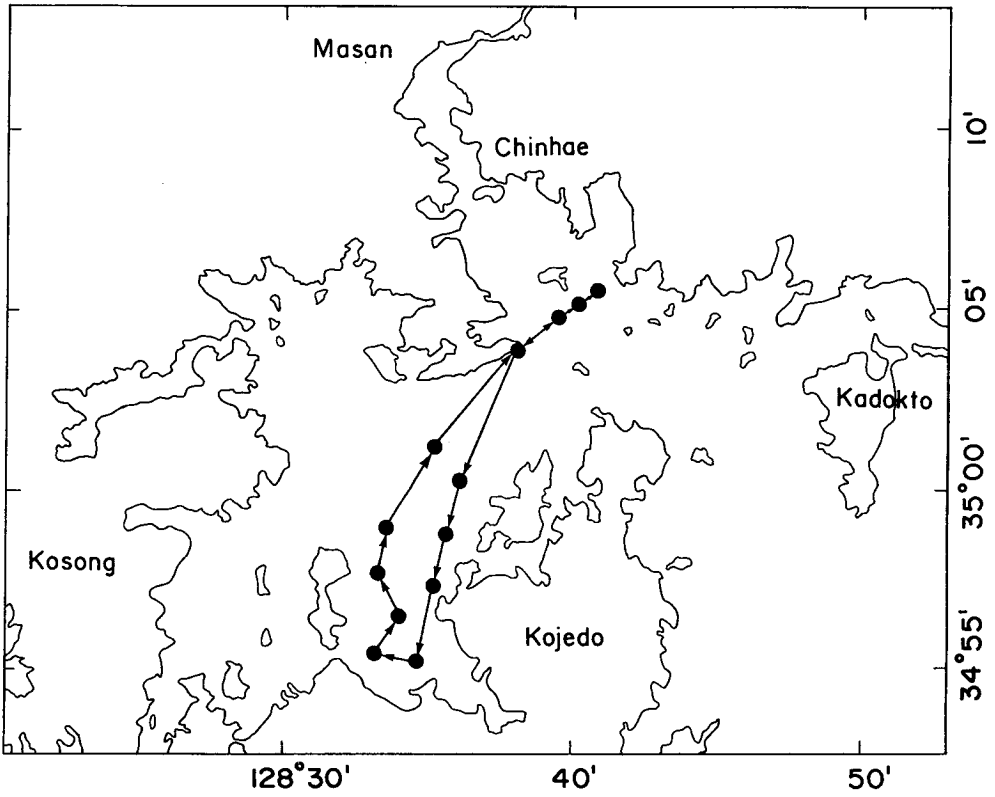
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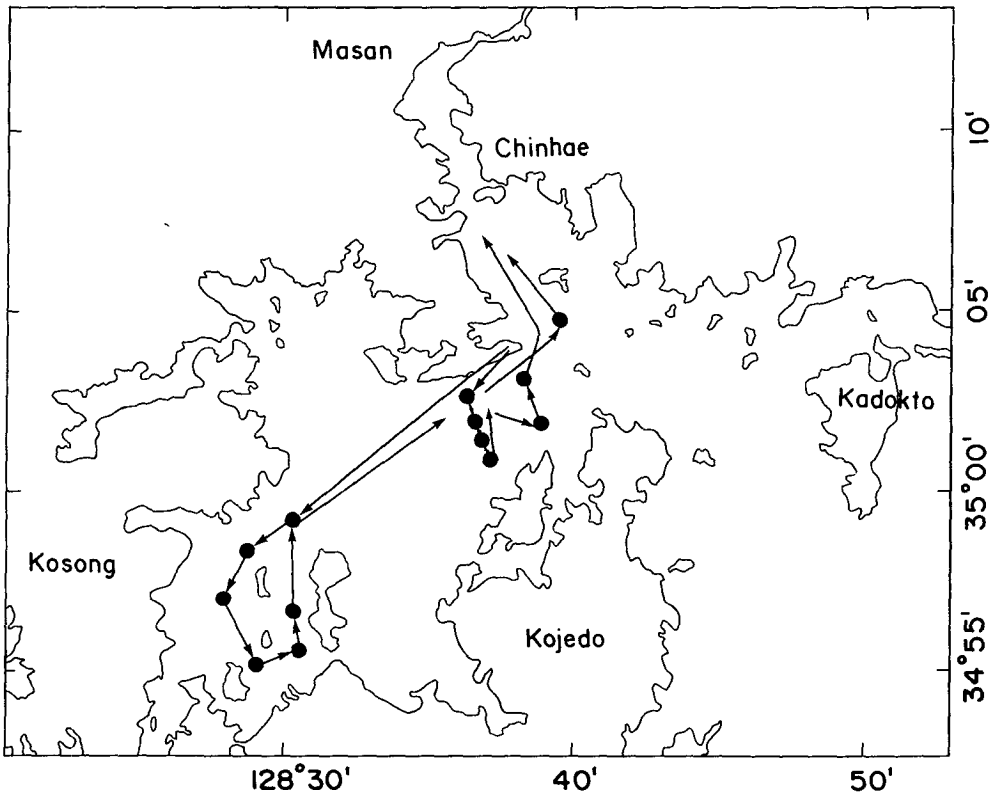
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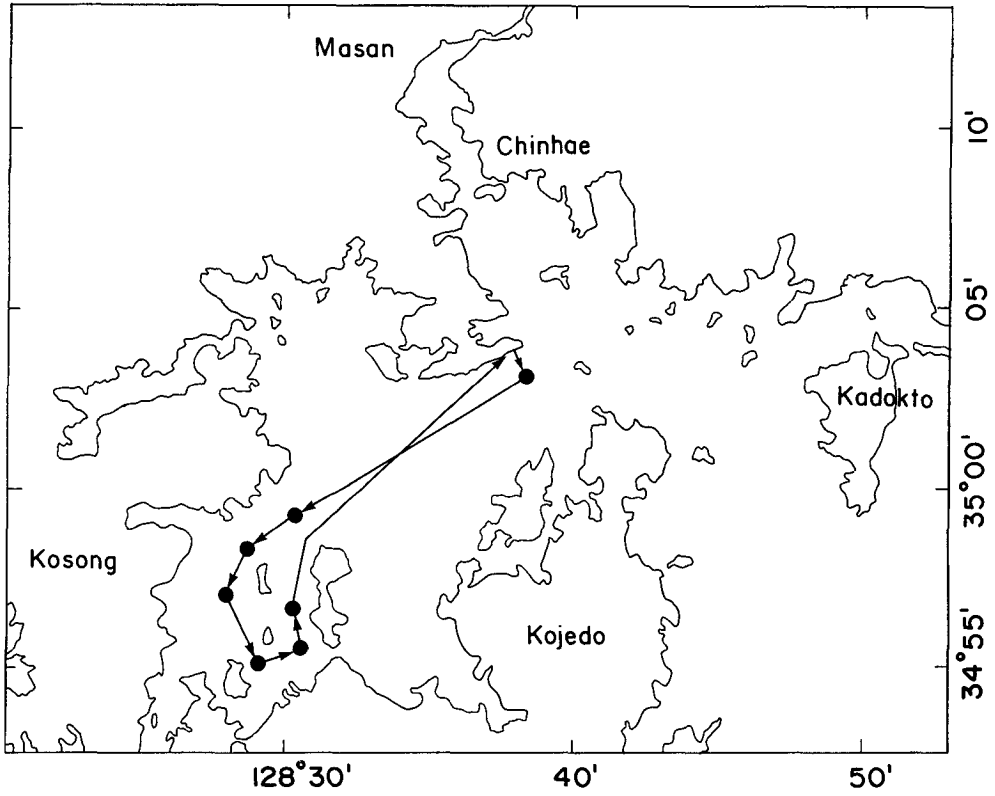
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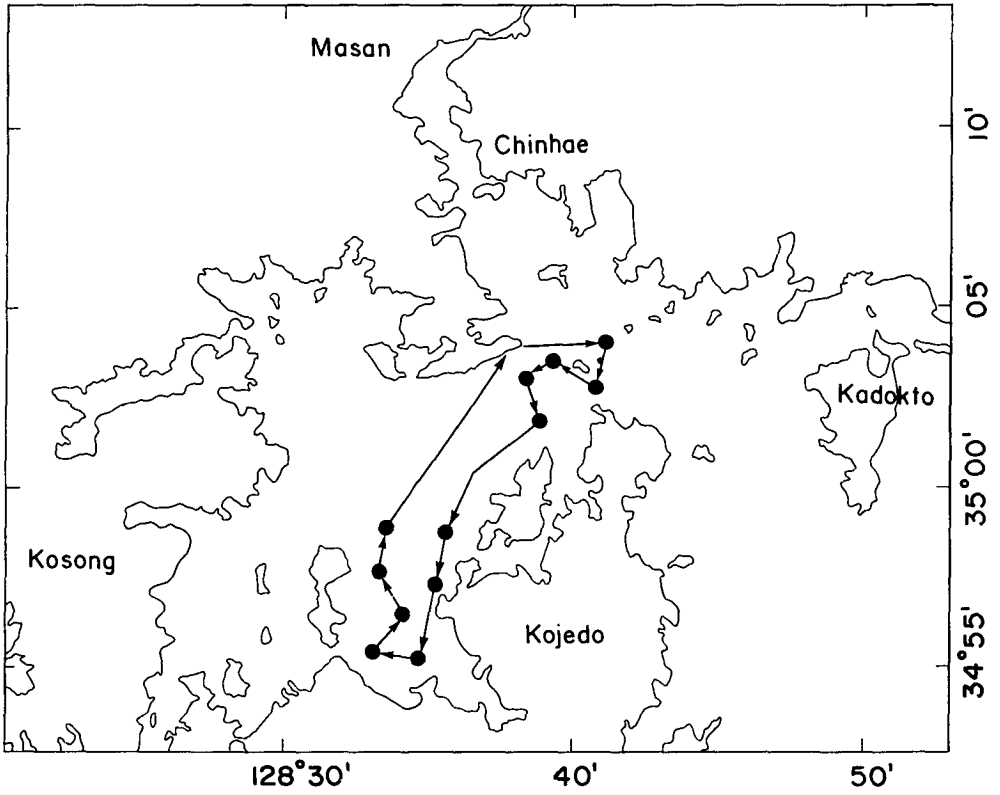
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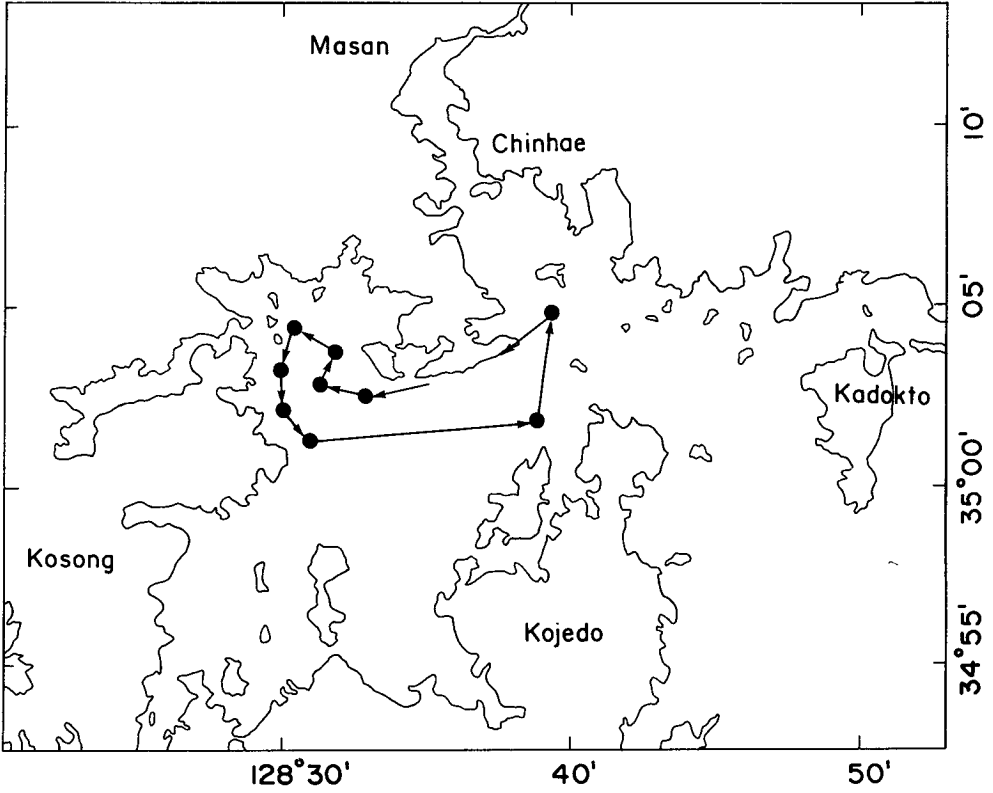
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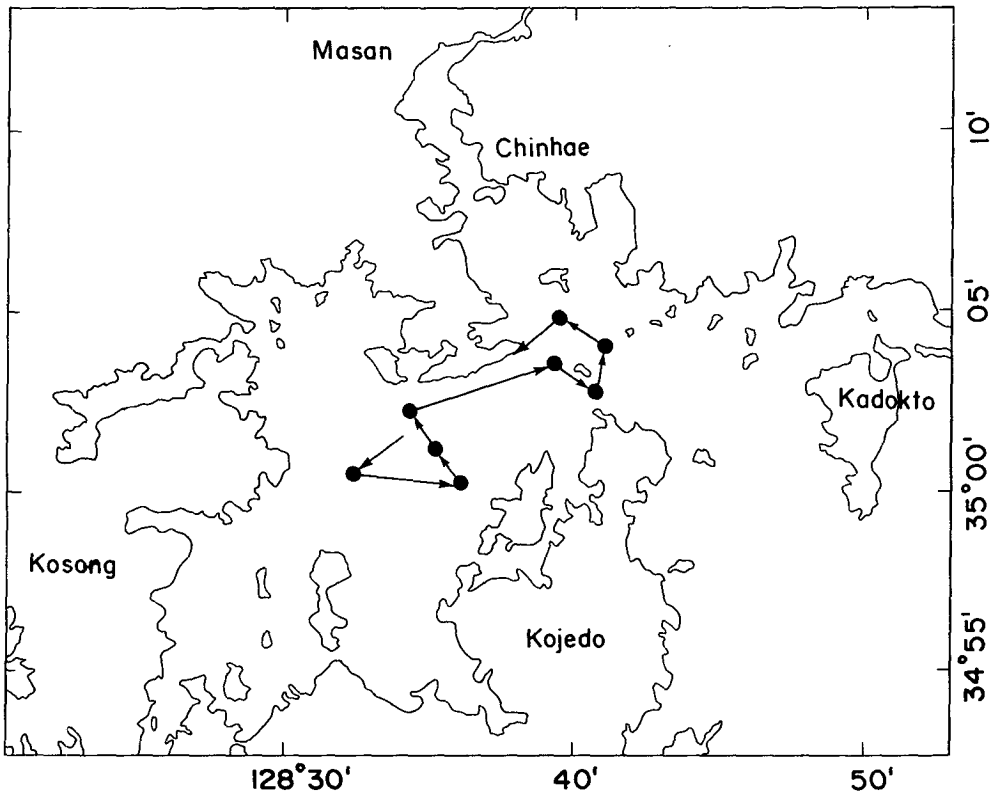
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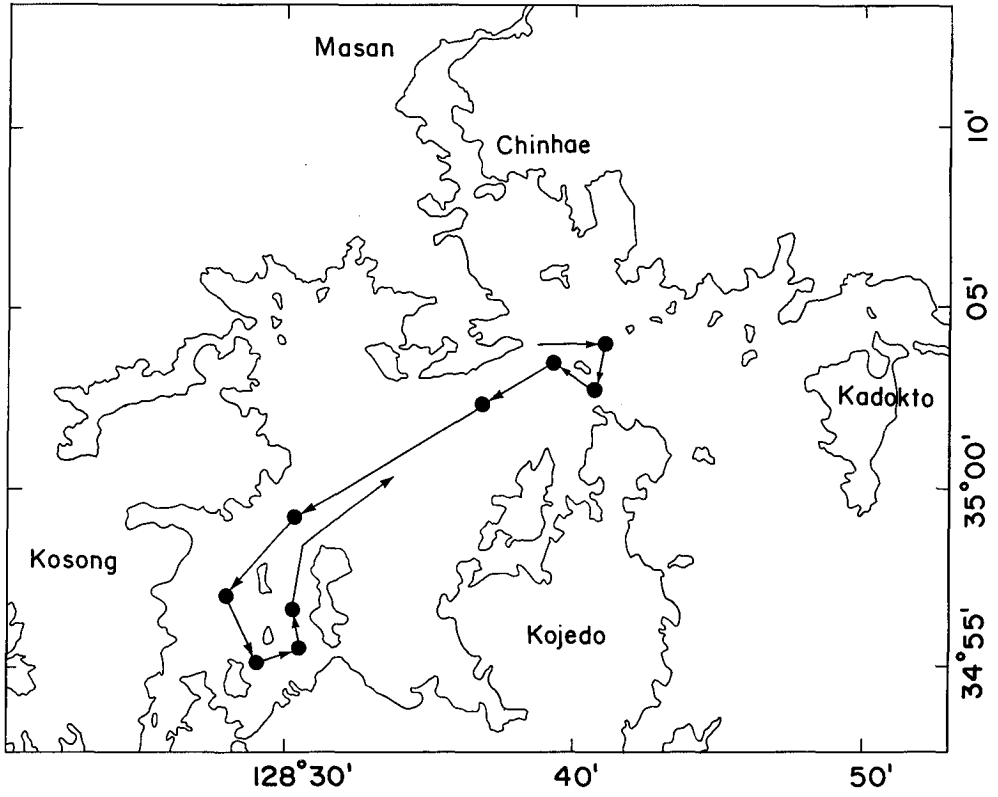
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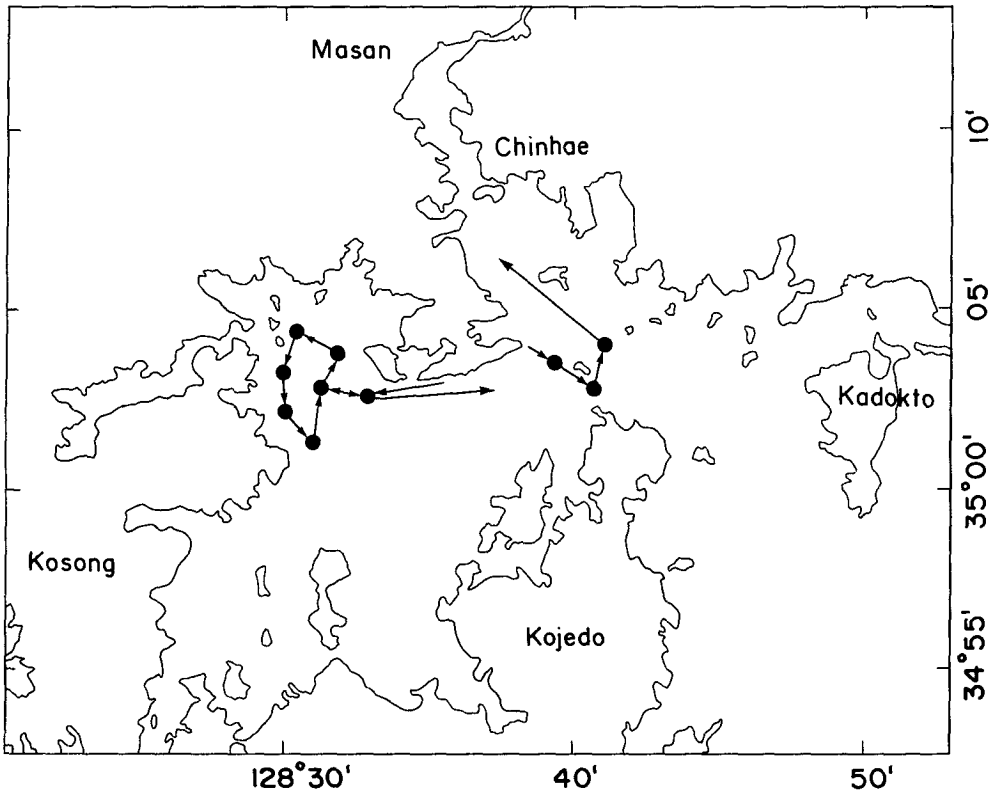
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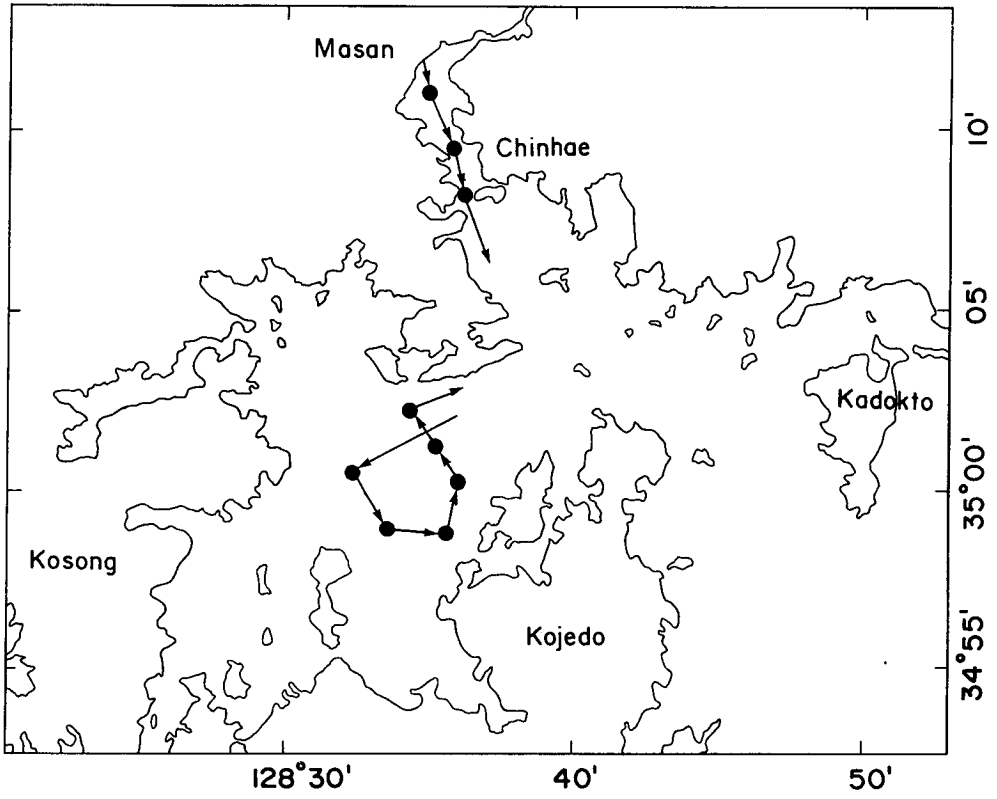
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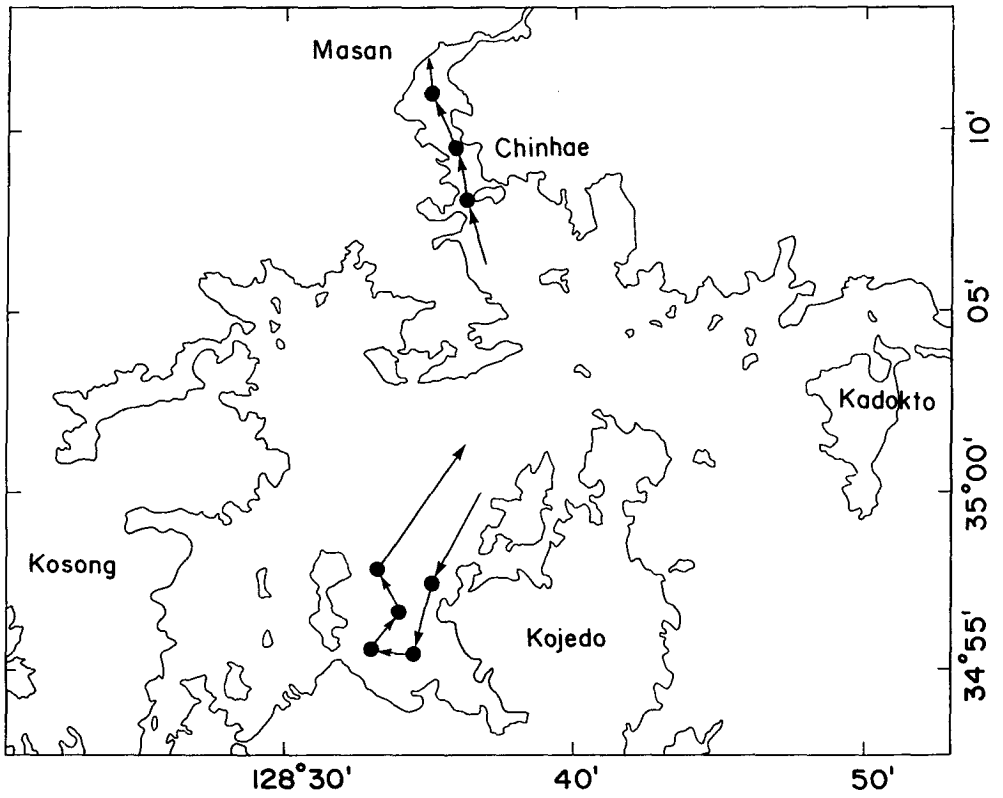
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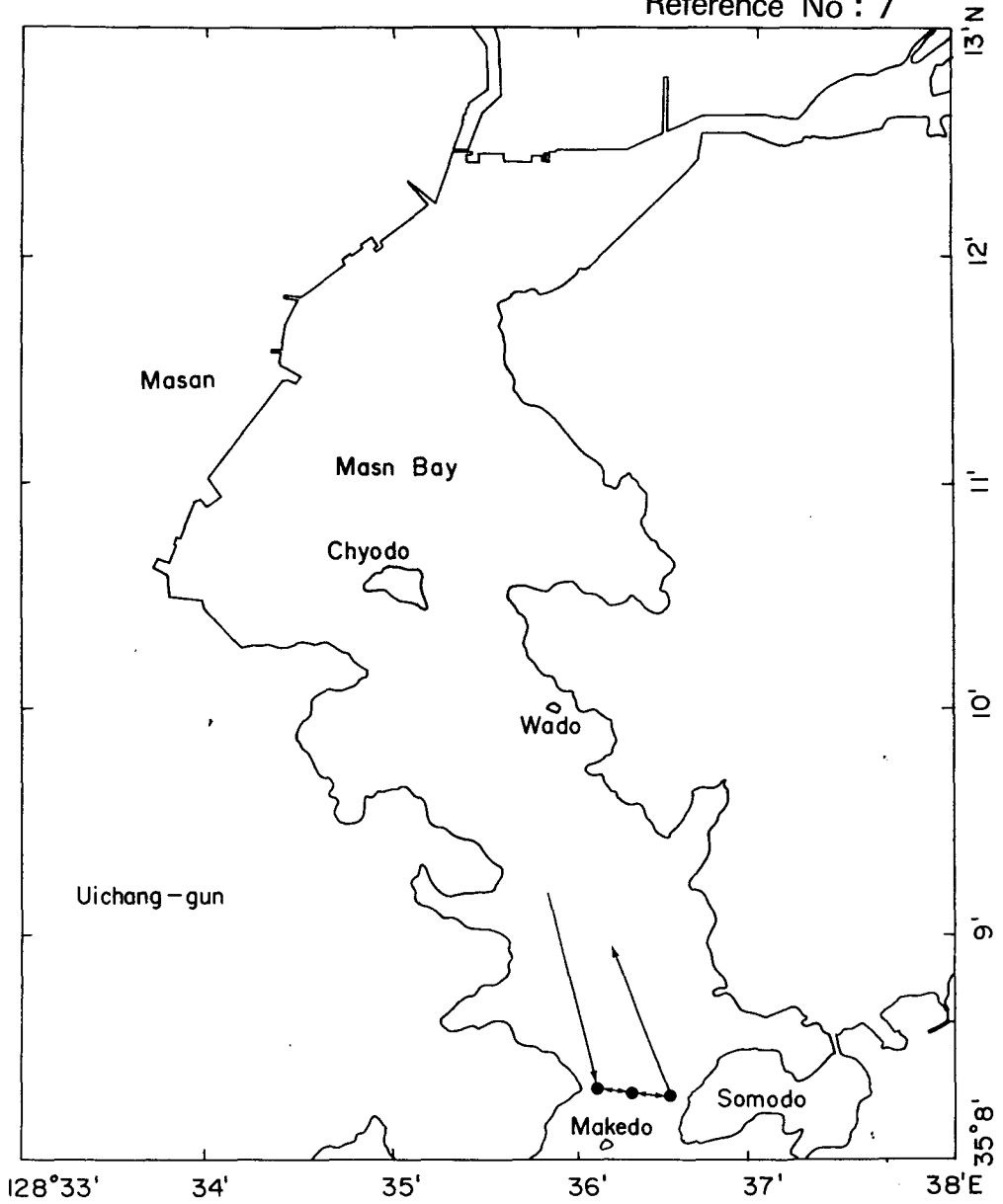
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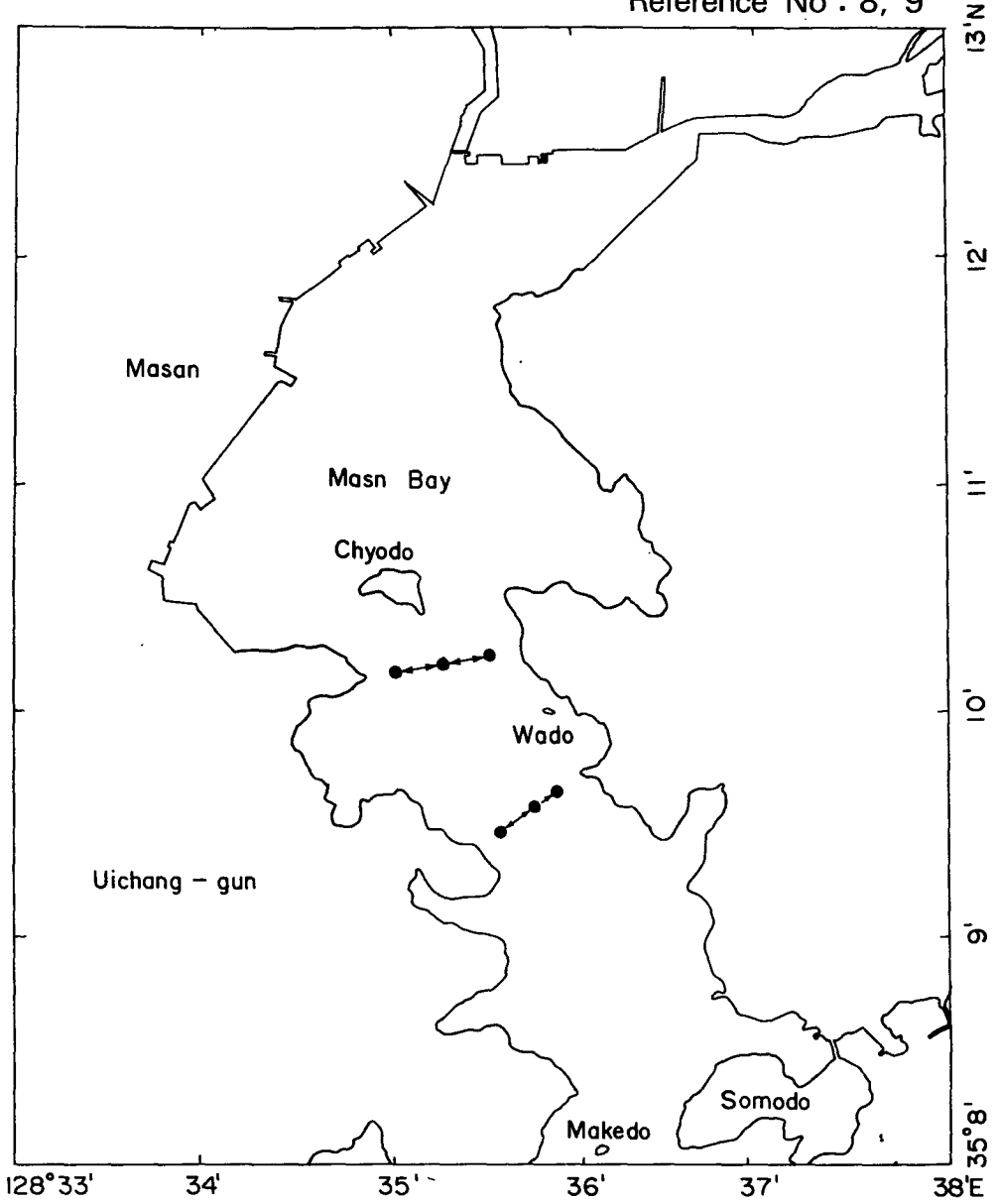
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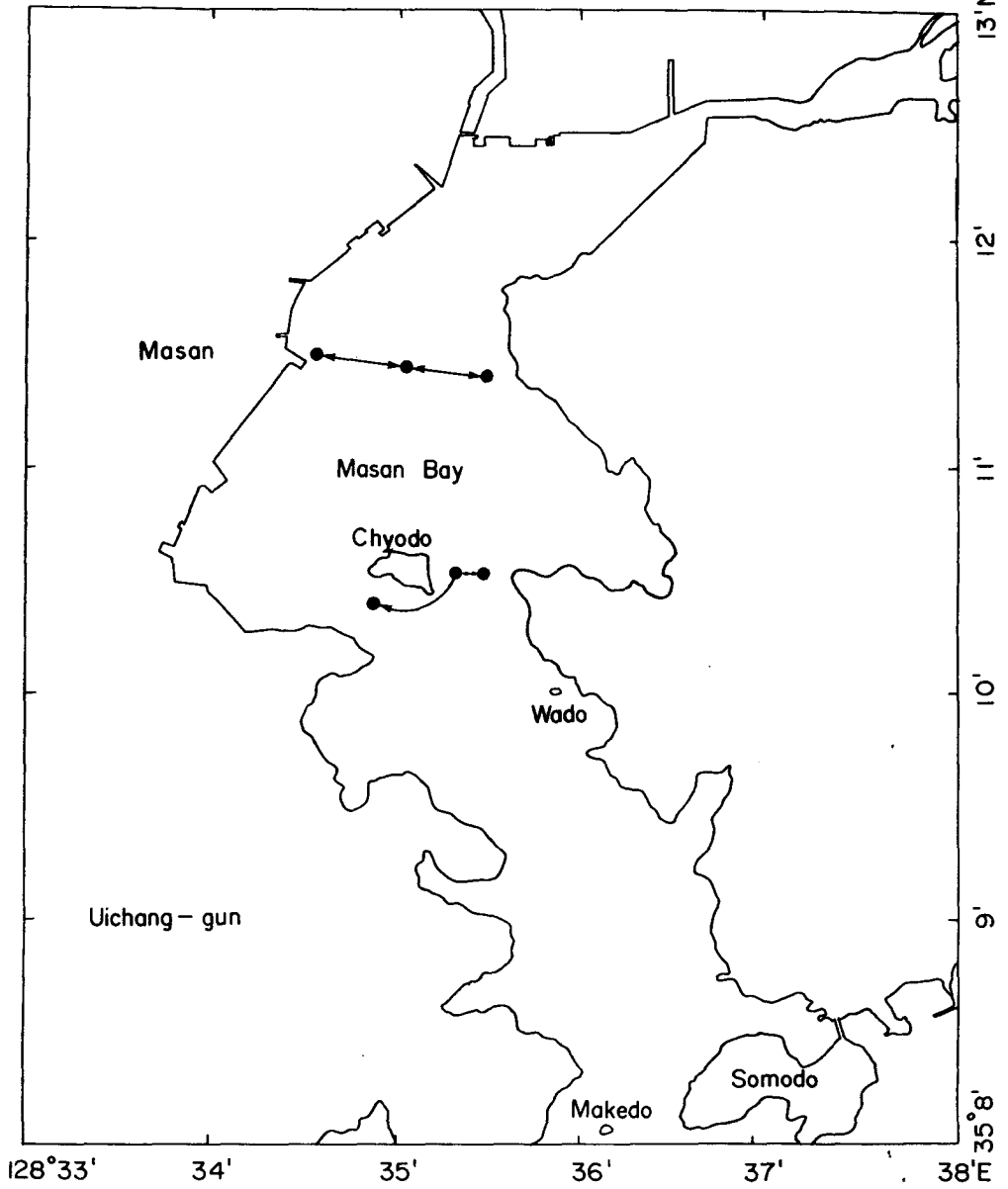
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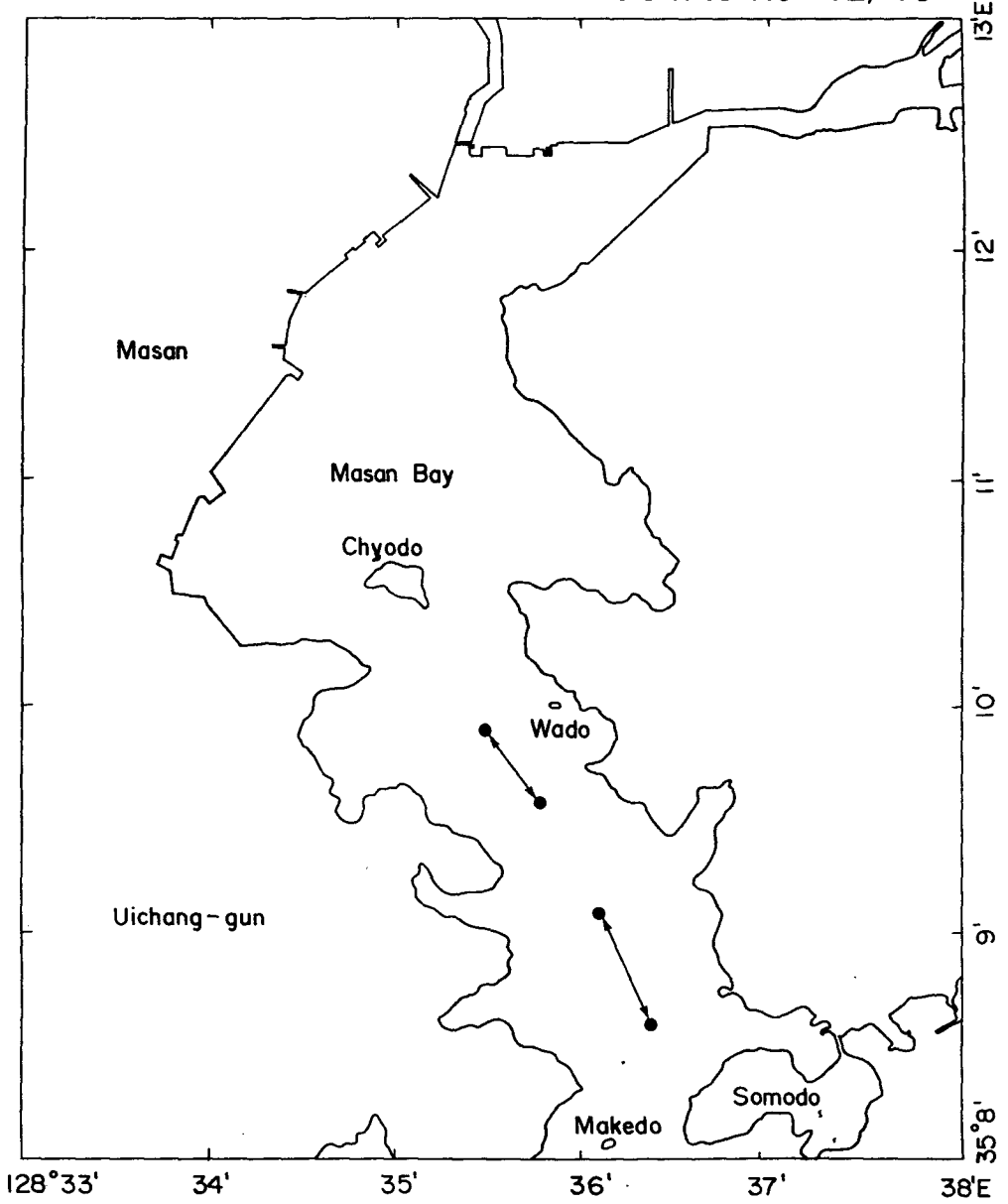
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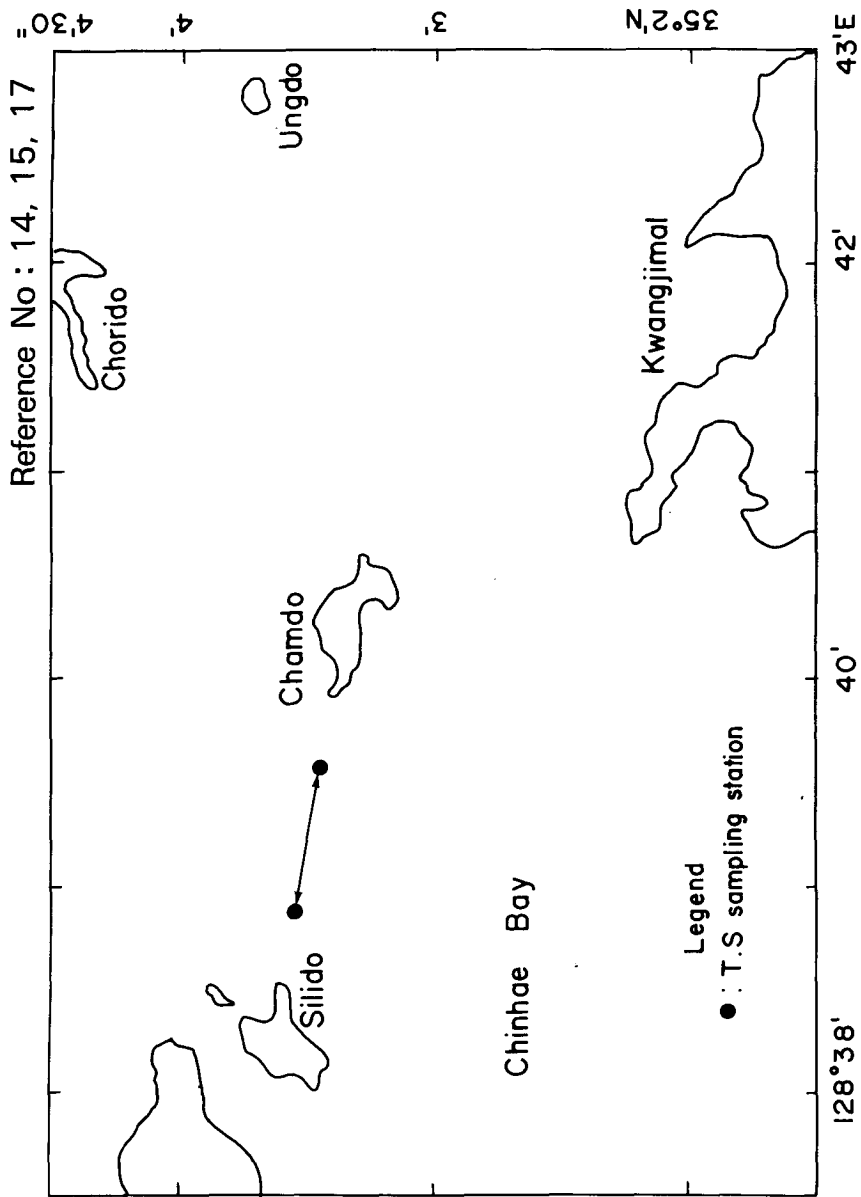


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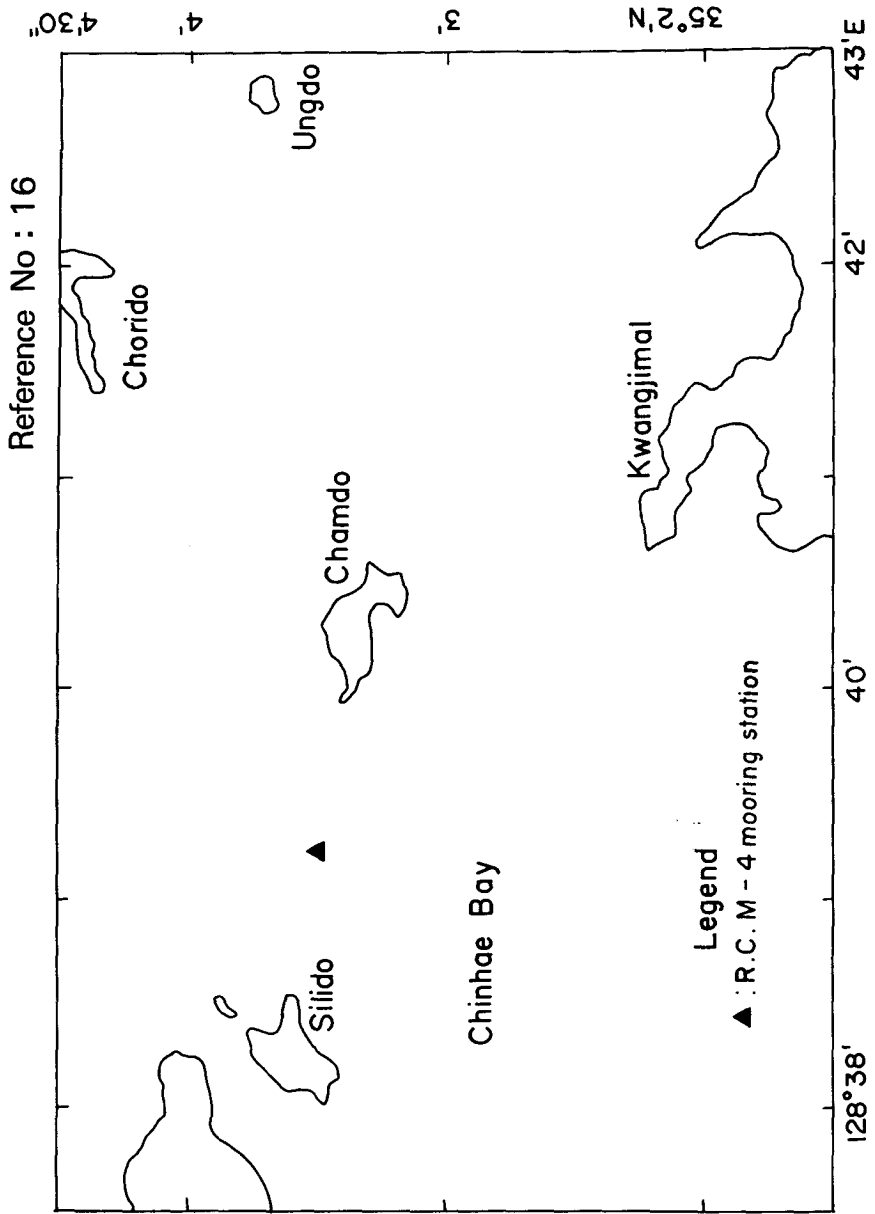
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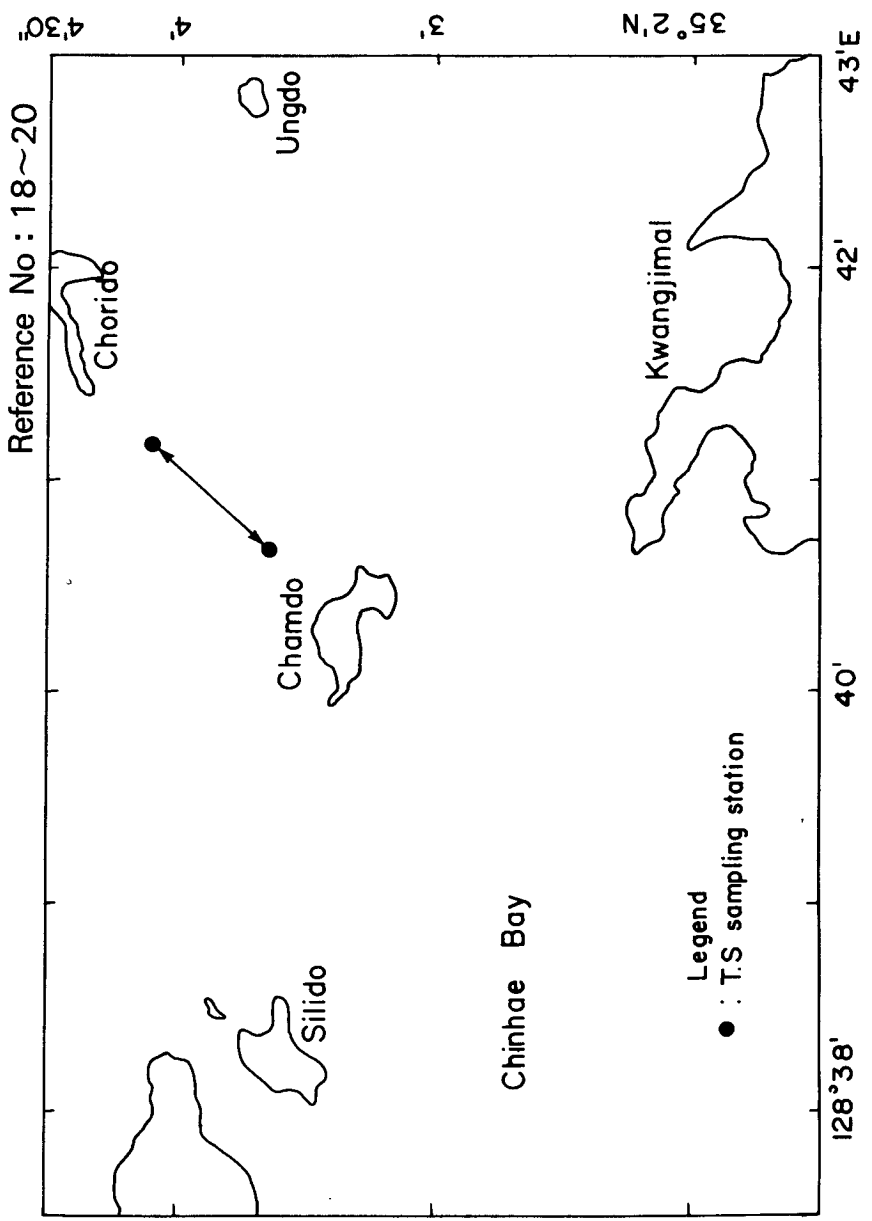
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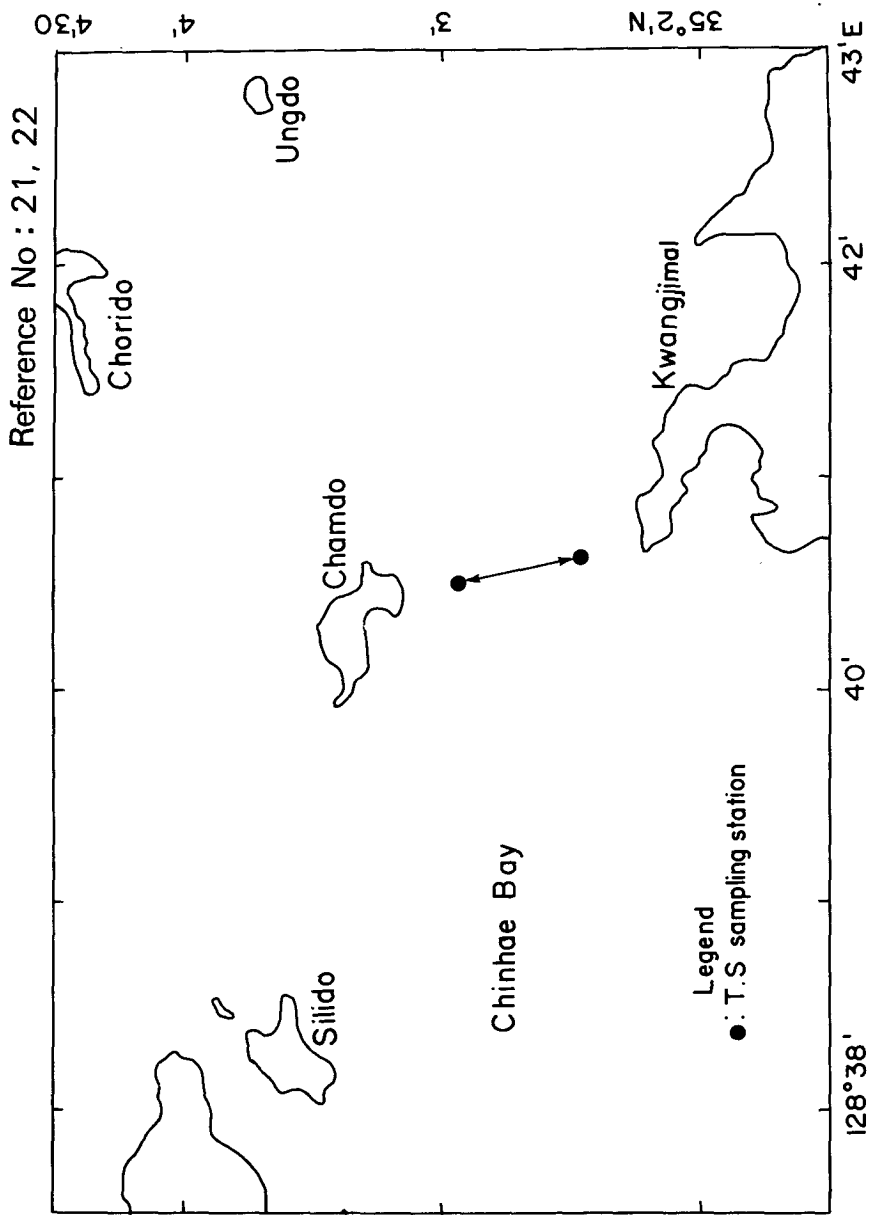
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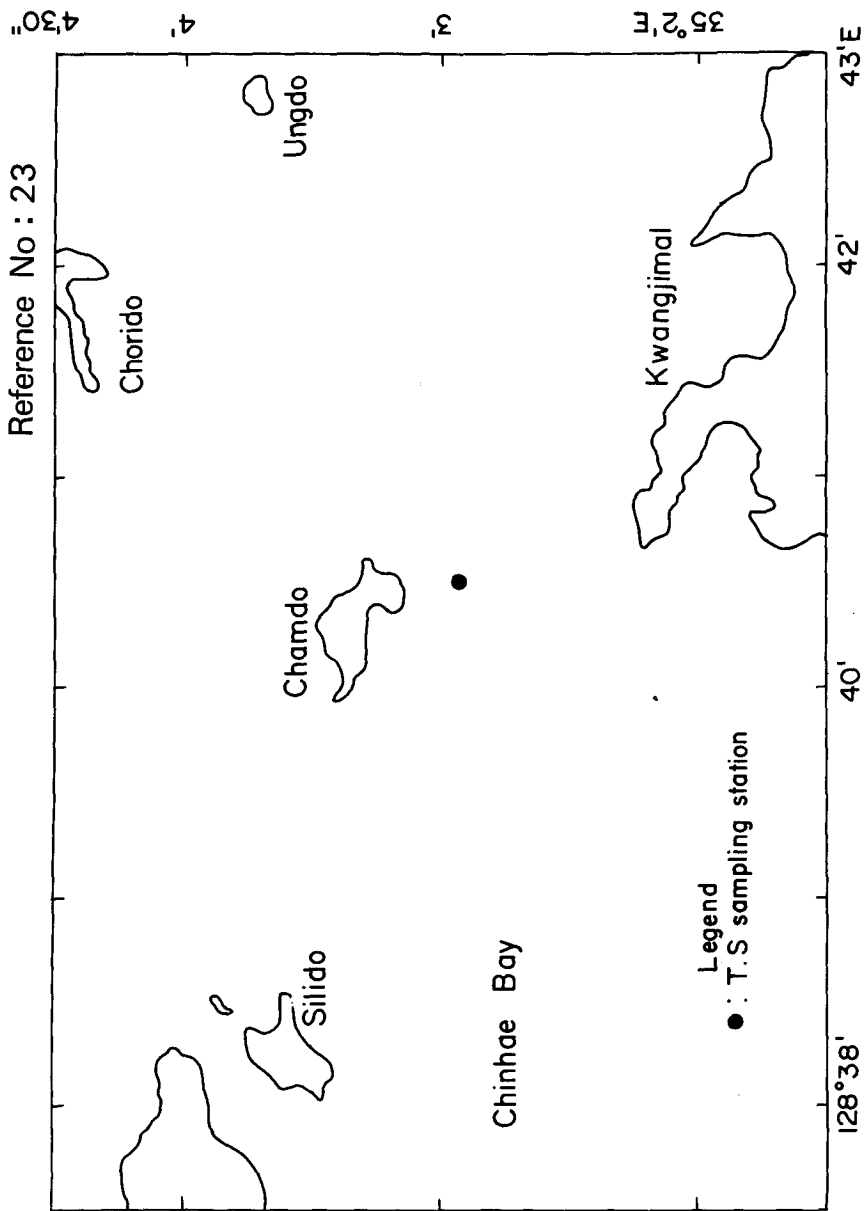
Track chart



Track chart

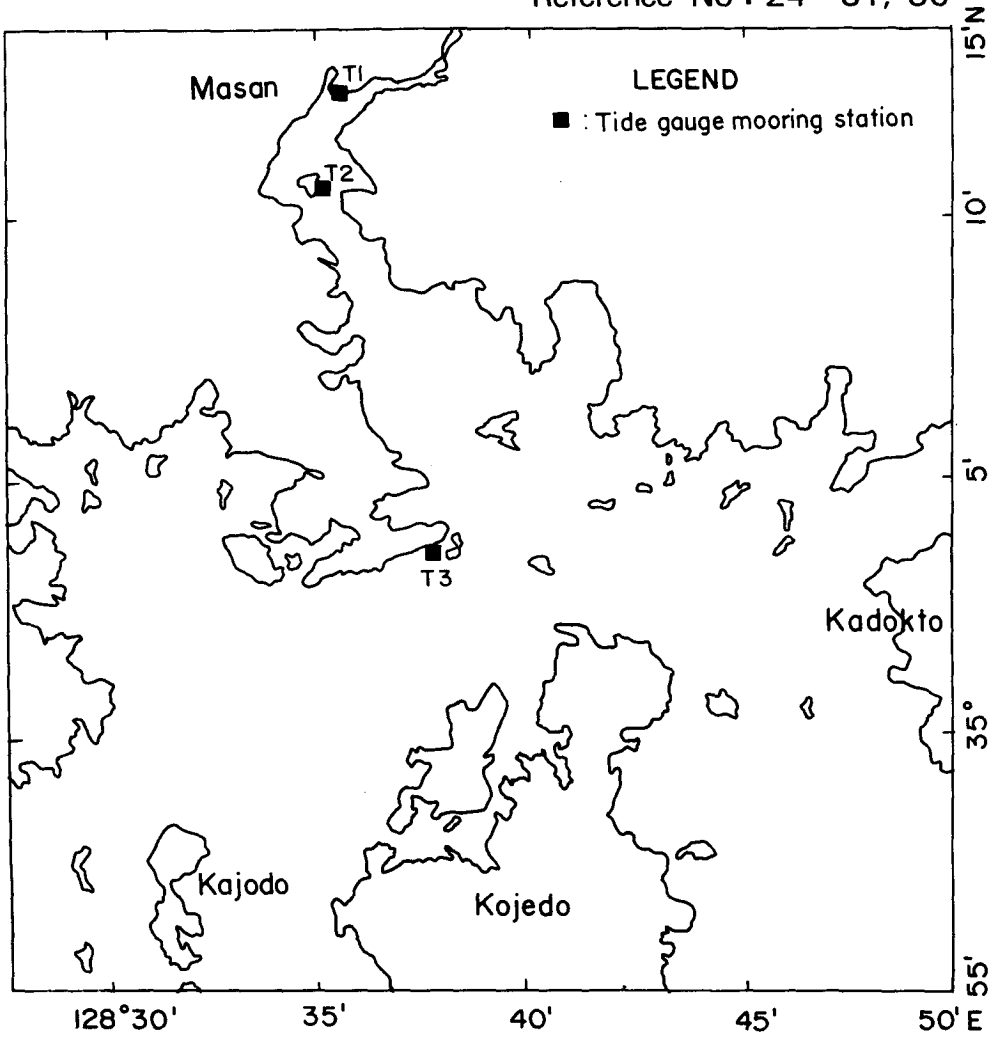


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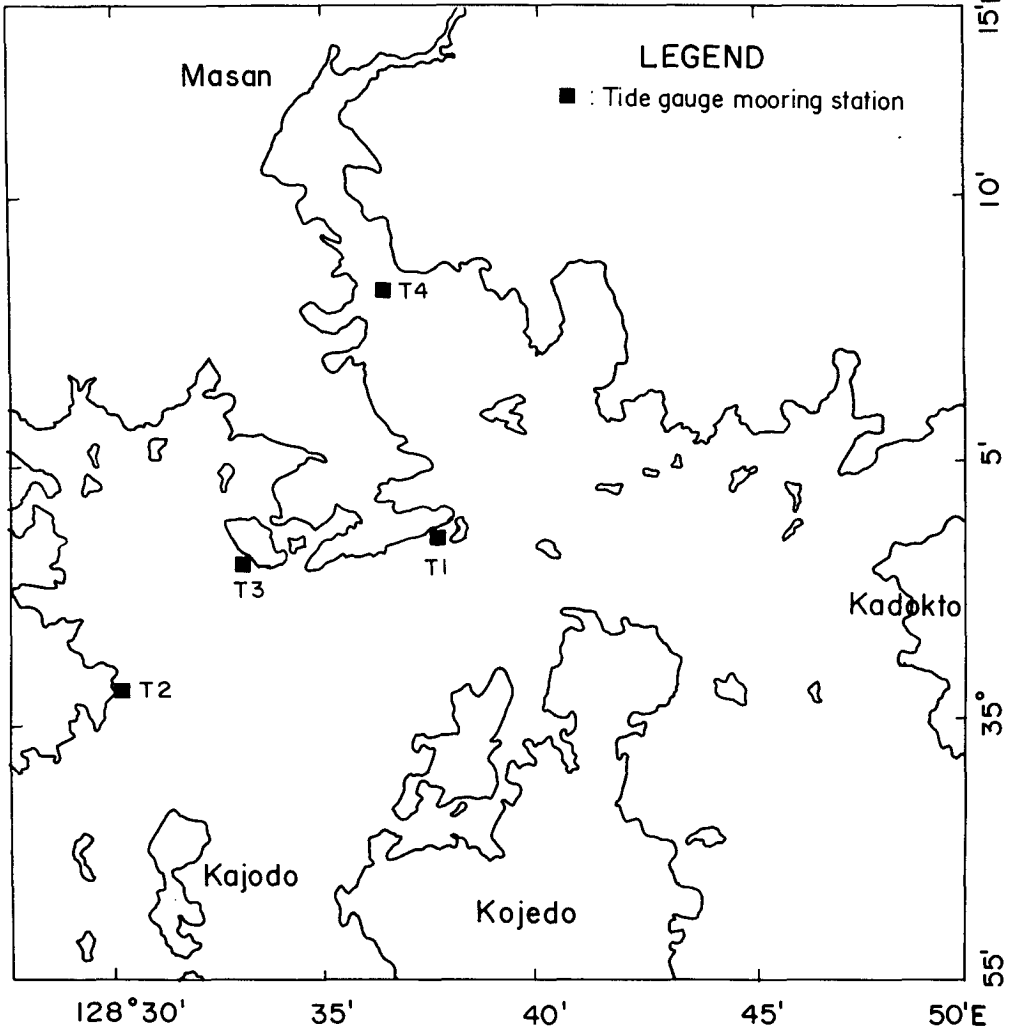
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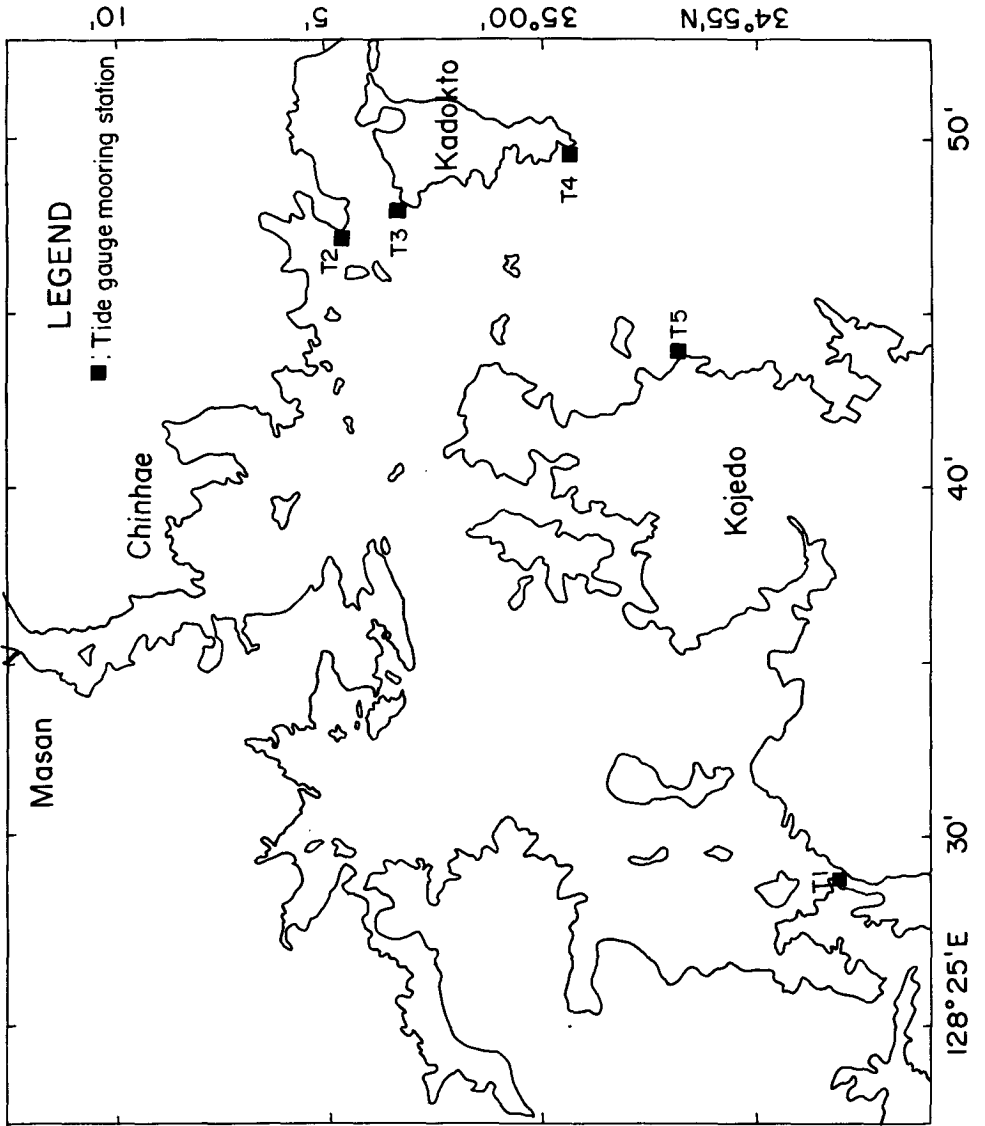
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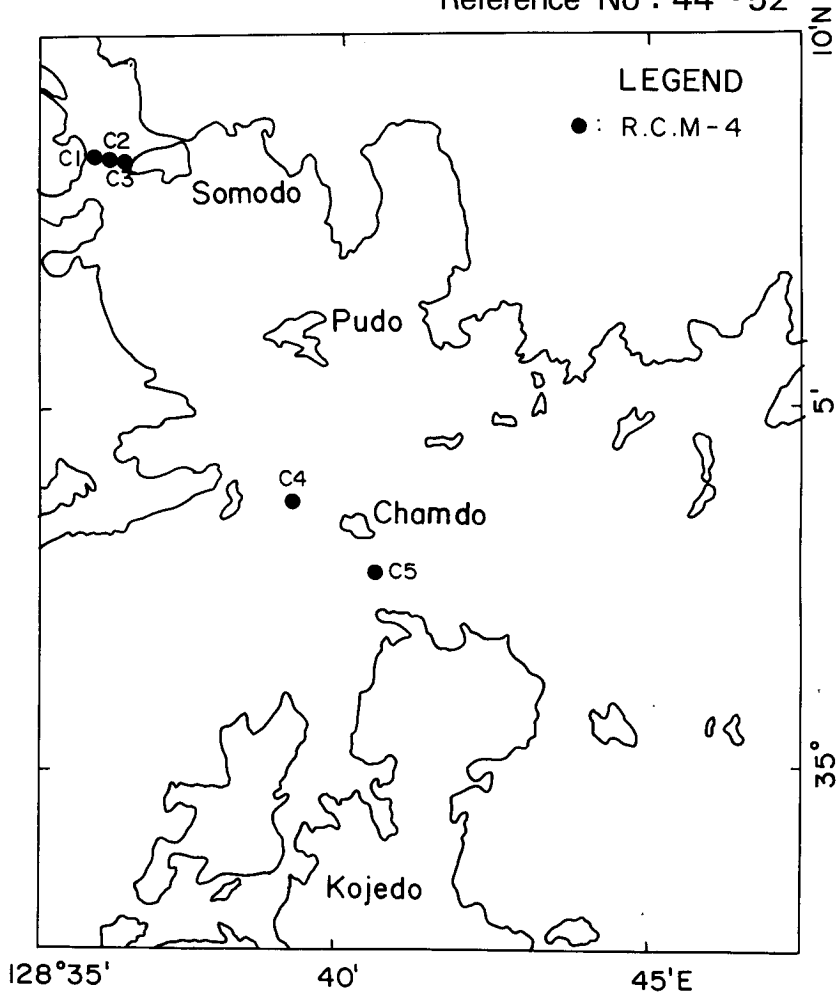
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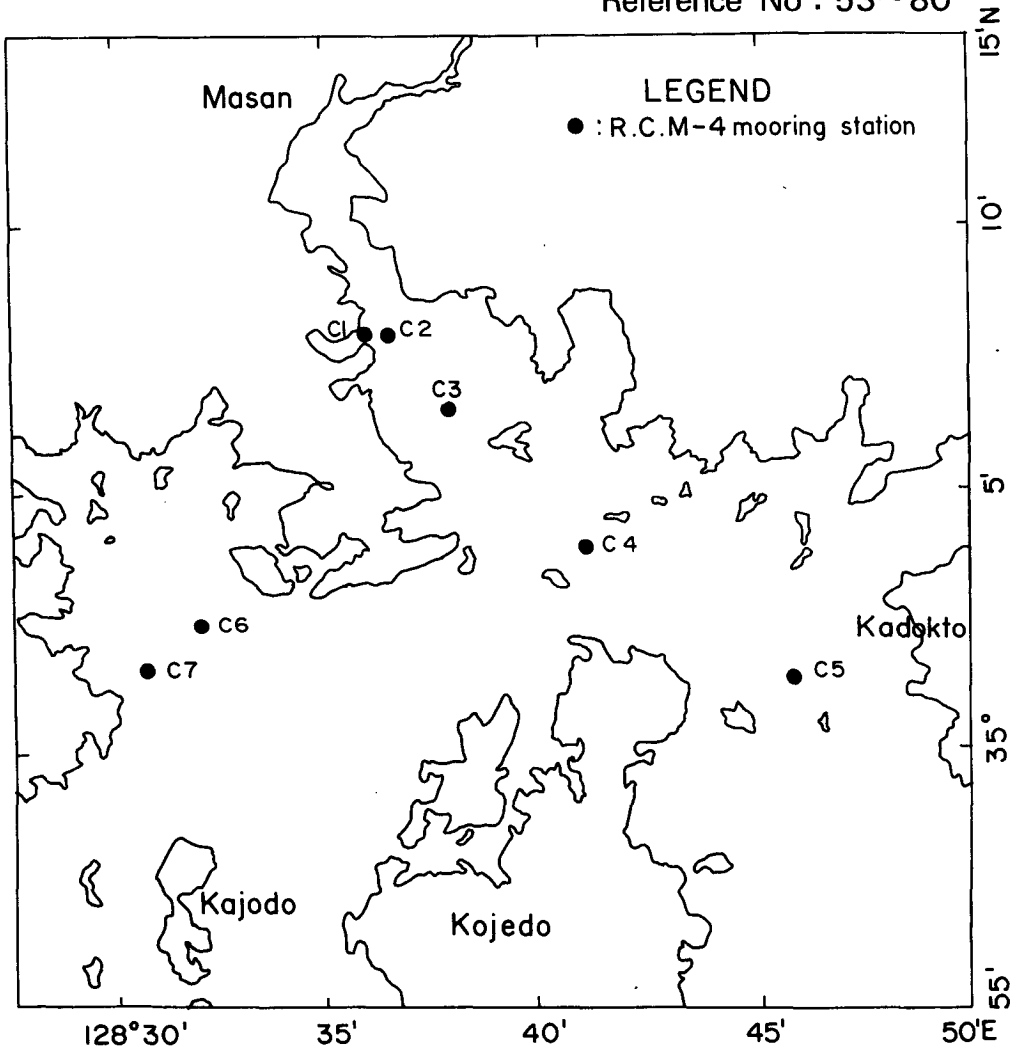
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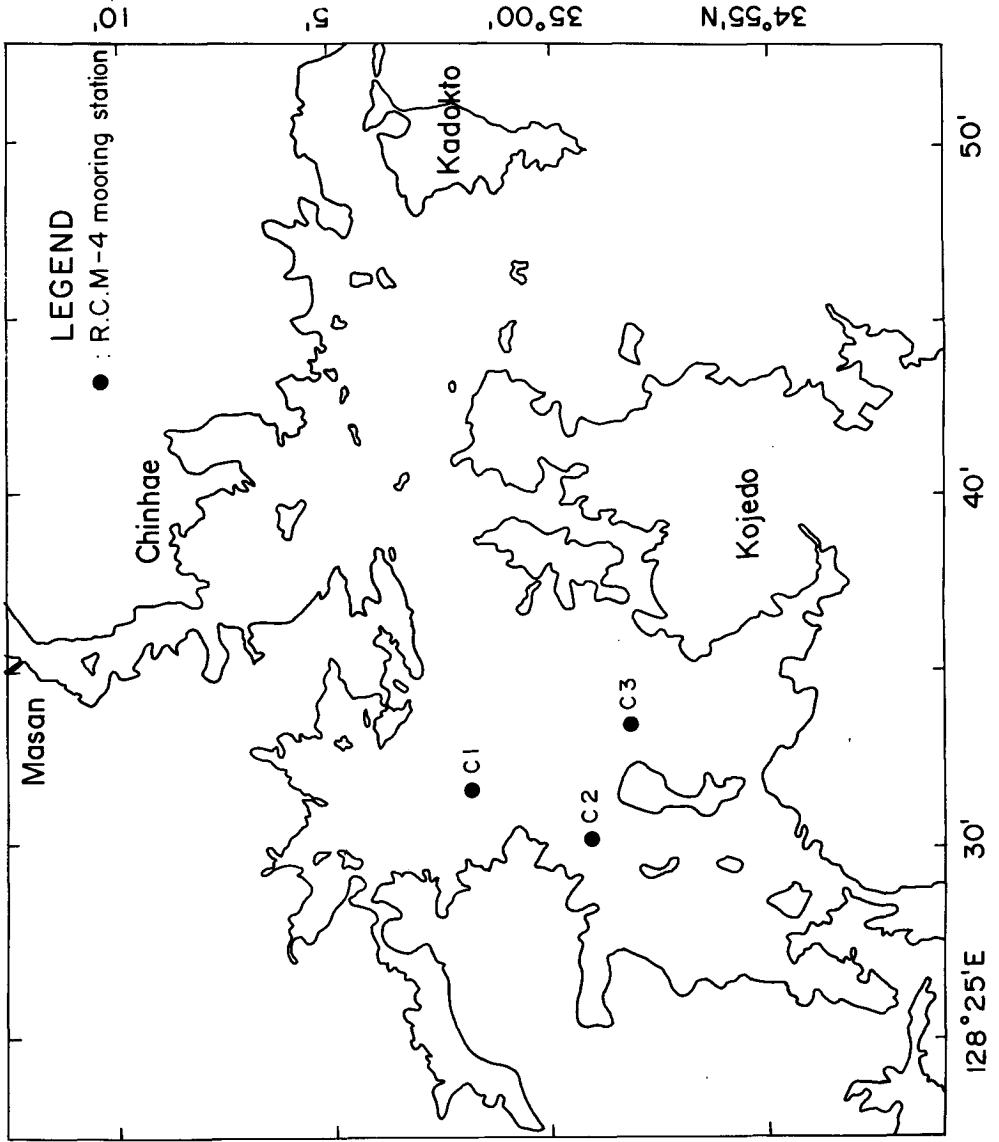
Track chart

Reference No : 53~80



Track chart

Reference No : 81~85



제 4 장 결 어

1. 본 연구사업을 통해서 수행된 내용은 다음과 같다.

- 가. 해양자료관리 - 입수, 처리, 검색, 제공 - 상의 업무내용을 OJT를 통하여 숙지
- 나. 해양자료관리를 위해 활용될 DB, 프로그램, 문헌의 수집
- 다. 해양자료의 발굴, 추적상 잠재하고 있는 문제점들의 파악
- 라. 자료집 발간에 선행되는 업무내용의 파악 및 정리
- 마. 진해만 해양물리 관측 자료의 ROSCOP 서식에 의한 정리
- 바. 미국 NODC의 자료관리 체제에 준한 진해만 자료의 정리체제 시도

2. 본 연구사업의 성과는 다음과 같이 요약될 수 있다.

- 가. 해양자료의 편집, 발간을 위한 자료의 정비체제 구축 경험
- 나. 해양관측자료의 Inventory 정리(ROSCOP 서식)

3. 건의사항

- 가. 해양관측자료의 발굴, 수집, 처리와 저장, 검색 및 제공에 관련하여 해양학 전공의 인력이 다수 보완될 필요가 있으며, 적절한 훈련을 통하여 기술 습득이 절실하다.
- 나. 국내 해양자료의 교환, 보급을 위한 인력과 기술의 제공, 공유가 가능토록 지구과학 자료 관리체제가 구축될 필요가 있다.
- 다. 관측자료의 제공, 공개가 법적으로 의무화되어서 국가지원의 연구사업 결과로 생성된 관측자료가 다수의 사용자에게 공개되고 활용될 수 있도록 하는 제도적 마련이 요구된다.

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(References)

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