APPRAISAL
VOLUME 1 (PART 1)
Dixon Extrance, Hecate Strait, Queen Charlotte
Sound and Adjoining B.C. Coastal Waters:
Physical Oceanography - Temperature,
Salinity, Currents, Water Levels and Waves
1903 through 1984

WEST COAST DATA INVENTORY AND

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1985

CANADIAN DATA REPORT OF HYDROGRAPHY AND OCEAN SCIENCES NO. 37



Canadian Data Report Of Hydrography and Ocean Sciences

Data reports provide a medium for the documentation and dissemination of data in a form directly useable by the scientific and engineering communities. Generally, the reports contain raw and/or analyzed data but will not contain interpretations of the data. Such compilations commonly will have been prepared in support of work related to the programs and interests of the Ocean Science and Surveys (OSS) sector of the Department of Fisheries and Oceans.

Data reports are not intended for general distribution and the contents must not be referred to in other publications without prior written authorization from the issuing establishment. The correct citation appears above the abstract of each report. Data reports are abstracted in *Aquatic Sciences and Fisheries Abstracts* and indexed in the Department's annual index to scientific and technical publications.

Data reports are produced regionally but are numbered nationally. Requests for individual reports will be filled by the issuing establishment listed on the front cover and title page. Out of stock reports will be supplied for a fee by commercial agents.

Regional and headquarters establishments of Ocean Science and Surveys ceased publication of their various report series as of December 1981. A complete listing of these publications is published in the *Canadian Journal of Fisheries and Aquatic Sciences*, Volume 39: Index to Publications 1982. The current series, which begins with report number 1, was initiated in January 1982.

Rapport statistique canadien sur l'hydrographie et les sciences océaniques

Les rapports statistiques servent de véhicule pour la compilation et la diffusion des données sous une forme directement utilisable par les scientifiques et les techniciens. En général, les rapports contiennent des données brutes ou analysées, mais ne fournissent pas d'interprétation des données. Ces compilations sont préparées le plus souvent à l'appui de travaux liés aux programmes et intérêts du service des Sciences et levés océaniques (SLO) du ministère des Pêches et des Océans.

Les rapports statistiques ne sont pas destinés à une vaste distribution et leur contenu ne doit pas être mentionné dans une publication sans une autorisation écrite préalable de l'établissement auteur. Le titre exact paraît au-dessus du résumé de chaque rapport. Les rapports statistiques sont résumés dans la revue Résumés des sciences halieutiques et aquatiques, et ils sont classés dans l'index annuel des publications scientifiques et techniques du Ministère.

Les rapports statistiques sont produits à l'échelon régional, mais numérotés à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page du titre. Les rapports épuisés sont fournis contre rétribution par des agents commerciaux.

Les établissements des Sciences et levés océaniques dans les régions et à l'administration centrale ont cessé de publier leurs diverses séries de rapports en décembre 1981. Une liste complète de ces publications figure dans le volume 39, Index des publications 1982, du *Journal canadien des sciences halieutiques et aquatiques*. La série actuelle a commencé avec la publication du rapport numéro 1 en janvier 1982.

CANADIAN DATA REPORT OF HYDROGRAPHY AND OCEAN SCIENCES NO. 37

1985

WEST COAST DATA INVENTORY AND APPRAISAL
VOLUME 1 (PART 1)

Dixon Entrance, Hecate Strait, Queen Charlotte Sound
and Adjoining B.C. Coastal Waters:
Physical Oceanography - Temperature, Salinity,
Currents, Water Levels and Waves
1903 through 1984

Ъу

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PREFACE

To manage Canadian West Coast waters competently, there is a fundamental requirement to review the sufficiency and suitability of the available scientific data for many purposes — such as engineering design, regulation, assessment, planning, research and monitoring. We consider this review to consist of three phases: (i) the cataloguing, mapping and methods—appraisal of all existing data sets; (ii) the actual scrutiny of the data themselves and the judgement of their utility for answering management questions; and (iii) the analysis and interpretation of the best of these data.

This inventory, which indexes the physical-oceanographic data of Dixon Entrance, Hecate Strait, Queen Charlotte Sound and adjoining waters, is considered a major contribution to phase (i). It has been produced by the Ocean Information Division at the Institute of Ocean Sciences, Department of Fisheries and Oceans, as part of a Data Inventory and Appraisal Program. Contract projects, supervised by government scientists and funded by numerous federal agencies, have examined all known marine-data sets which contain oceanographic information obtained in the areas in question. Evaluation of the data-set quality has been carried out by careful examination of the documentation for methodologies used in sampling, storage and analysis.

It is our hope that this inventory will assist you, both in establishing the usefulness of existing data for whatever particular purpose contemplated, and in assessing the confidence to be placed in the interpretations. In addition, it should aid in setting priorities for archiving large quantities of data into the Department's Marine Environmental Data Service (MEDS) in Ottawa.

L. F. Giovando
B. D. Smiley
Scientific Coordinators
Canadian West Coast Compilation
 and Appraisal Series

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ABSTRACT

Birch, J.R., E.C. Luscombe, D.B. Fissel and L.F. Giovando. West Coast Data Inventory and Appraisal. Volume 1. Dixon Entrance, Hecate Strait, Queen Charlotte Sound and Adjoining B.C. Coastal Waters: Physical Oceanography - Temperature, Salinity, Currents, Water Levels and Waves, 1903 through 1984. Can. Data Rep. Hydrogr. Ocean Sci. 37:(Vol. 1, Part 1, 302 p., Part 2, 265 p.)

This volume is one of a group of catalogues designed to inventory and appraise marine data sets collected in waters off the west coast of Canada. For user convenience, the group has been organized with its subject matter divided into three general disciplines: physics, chemistry and biology. The format throughout has been structured to facilitate comparison among subjects and regions. With such a large undertaking it is not possible to provide all catalogues at once; the present volume deals with physics only.

Data collection is a continuing process and further updates of these inventories are planned. Readers are requested to submit corrections and additions by writing the issuing establishment. Such corrections will be incorporated in on-line computerized data set listings and will be continuously available upon request.

Key words: British Columbia, Dixon Entrance, Hecate Strait, Queen Charlotte Sound, inventory, salinities, temperatures, currents, water levels, waves.

SOMMAIRE

Birch, J.R., E.C. Luscombe, D.B. Fissel and L.F. Giovando. West Coast Data Inventory and Appraisal. Volume 1. Dixon Entrance, Hecate Strait, Queen Charlotte Sound and Adjoining B.C. Coastal Waters: Physical Oceanography - Temperature, Salinity, Currents, Water Levels and Waves, 1903 through 1984. Can. Data Rep. Hydrogr. Ocean Sci. 37:(Vol. 1, Part 1, 302 p., Part 2, 265 p.)

Le présent volume fait partie d'un groupe de catalogues destinés à faire l'inventoire de et à évaluer les séries de données marines sur la côte ouest du Canada. Pour plus de commodité, la question traitée est structurée en trois grandes disciplines: physique, chimie et biologie. Les catalogues sont présentés de façon à faciliter la comparaison entre les sujets et les régions. Le domaine est si vaste qui'il est impossible de fournir tous les catalogues en une seule fois; le présent volume traite seulement la physique.

La collecte des données est un processus permanent et il est prévu de mettre à jour ces inventoires par la suite. Les lecteurs sont invités à soumettre par écrit les corrections et les additions à l'établissement auteur. Ces corrections seront traitées en direct sur ordinateur et incorporées aux listages qui pourront être obtenus sur demande.

Mots-clés: Colombie-Britannique, Dixon Entrance, Hecate Strait, Queen Charlotte Sound, inventoire, salinités, températures, courants, niveaux de la mer, ondes.

ACKNOWLEDGEMENTS

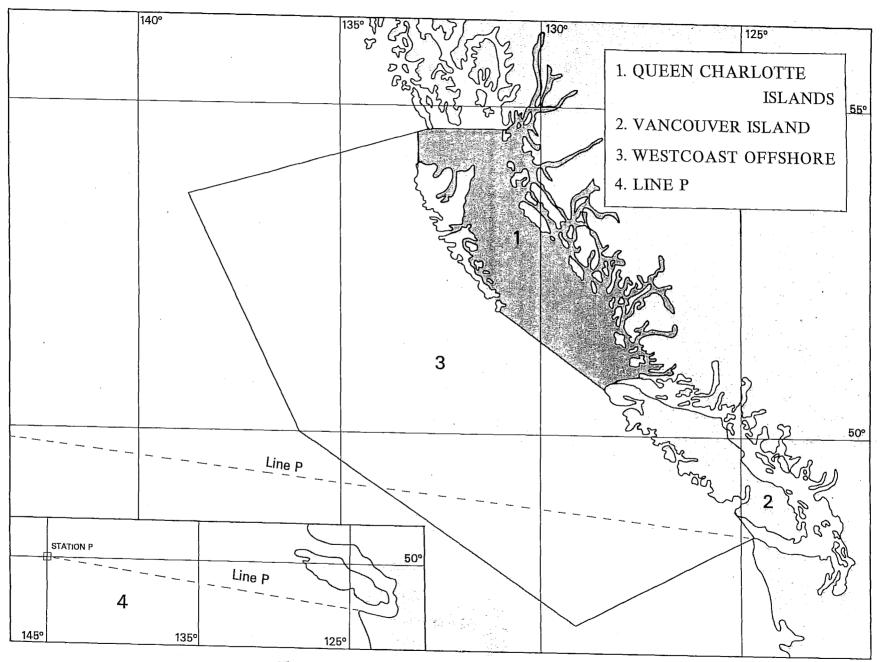
We thank Mr. G. Floyd for the supervision of ID number assignment and map production and Ms. L.S.C. Thomson for technical editing. Use was made of the MEDS and NODC data bases, as well as earlier inventories by Tabata (1980) and Dodimead (1980). We would like to thank the following for providing information and reviewing the manuscript: Dr. R. Thomson, Mr. D. Stucchi, Mr. A. Douglas, Mr. F. Stephenson, Dr. W. Crawford, and Dr. H. Freeland of the Institute of Ocean Sciences; Mr. D. Goyette of the Environmental Protection Service; and Mr. A. Dodimead of the Pacific Biological Station, Nanaimo. We appreciate the cooperation of Mr. R. Killam of AMAX Canada for permitting us access to their Alice Arm data. Special thanks are also due to the following Arctic Sciences Ltd. personnel: Ms. S. Norton, Mrs. J. Oberski, Mr. N. Goody, and Ms. N. Andrew for preparing the manuscript and Mr. R. Chave for computer program development.

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WEST COAST DATA INVENTORY AND APPRAISAL

VOLUME 1 (PART 1)

Dixon Entrance, Hecate Strait, Queen Charlotte Sound and Adjoining B.C. Coastal Waters: Physical Oceanography



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VOLUME 1: Dixon Entrance, Hecate Strait, Queen Charlotte Sound and Adjoining B.C. Coastal Waters: Physical Oceanography - Temperature, Salinity, Currents, Water Levels and Waves, 1903 through 1984.

VOLUME ABSTRACT

This inventory represents a catalogue of physical-oceanographic data collected in Dixon Entrance, Hecate Strait, Queen Charlotte Sound and the adjacent shoreward waters. Times and locations of measurements are listed and displayed graphically for temperature-salinity, current-meter, water-level, wave and drifter data. Yearly plots showing the locations of all measurements are included, as is an index of references by data set number. References and sources are listed for all data included in the inventory.

Key words: British Columbia, Dixon Entrance, Hecate Strait, Queen Charlotte Sound, inventory, salinities, temperatures, currents, water levels, waves.

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1. INTRODUCTION

In this report, the physical oceanographic data collected in Dixon Entrance, Hecate Strait, Queen Charlotte Sound and the adjacent shoreward waters are catalogued. The information provided includes the time and locations of measurements, the parameters measured, and the type of instrumentation. The data themselves are not included, but a source for the data and any reports or references utilizing the data are cited wherever possible. This will enable potential users of the data to determine what is available in their area of interest, what data were collected using a specific measurement technique, and whether those data may be of value.

About 350 data sets collected from 1903 through 1984 are summarized in Table 2.

The station header information is to be added to the ongoing data base at the Institute of Ocean Sciences, Sidney, B.C. As new data and/or previously-inaccessible data become available, they will be added to a computerized data base maintained by the Ocean Information Division. Information concerning new data sets, older data sets which are not in the catalogue, or errors, should be submitted to the Ocean Information Division of the Institute of Ocean Sciences.

2. STUDY AREA

The study area is indicated in Figure 1. Included are the three main bodies of water - Dixon Entrance, Hecate Strait and Queen Charlotte Sound - as well as all the adjoining inlets and sounds. Most of the area overlies the continental shelf, and has depths of less than 200 m. Troughs, having depths in excess of 300 m, cut into Dixon Entrance and Queen Charlotte Sound. Off the entrance to Portland Inlet, depths of 700 m have been recorded. The fjords often are characterized by sills and/or an estuarine circulation driven by freshwater input from land runoff. Thomson (1981a) provides a good overall description of the oceanography of the area.

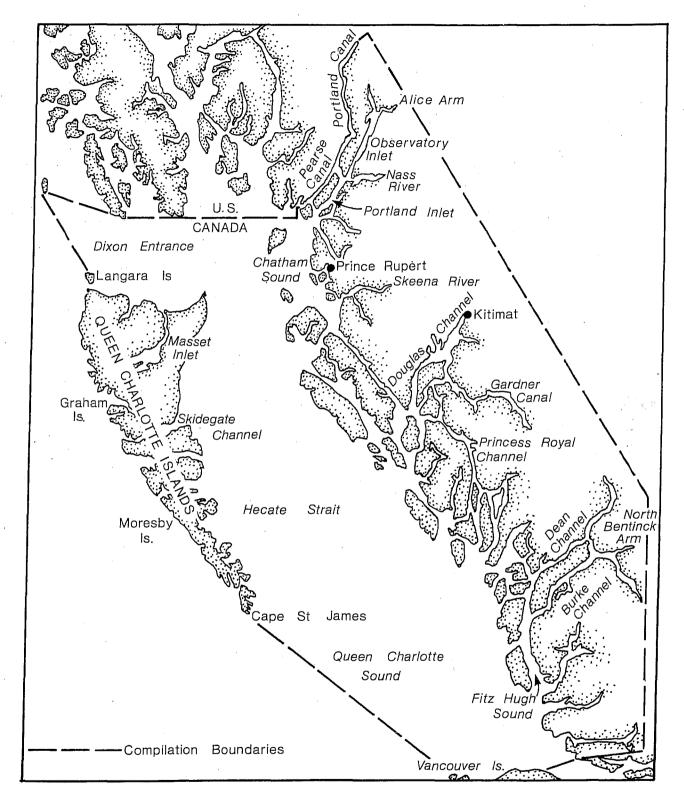


Figure la: Major placenames in the area covered by this data inventory.

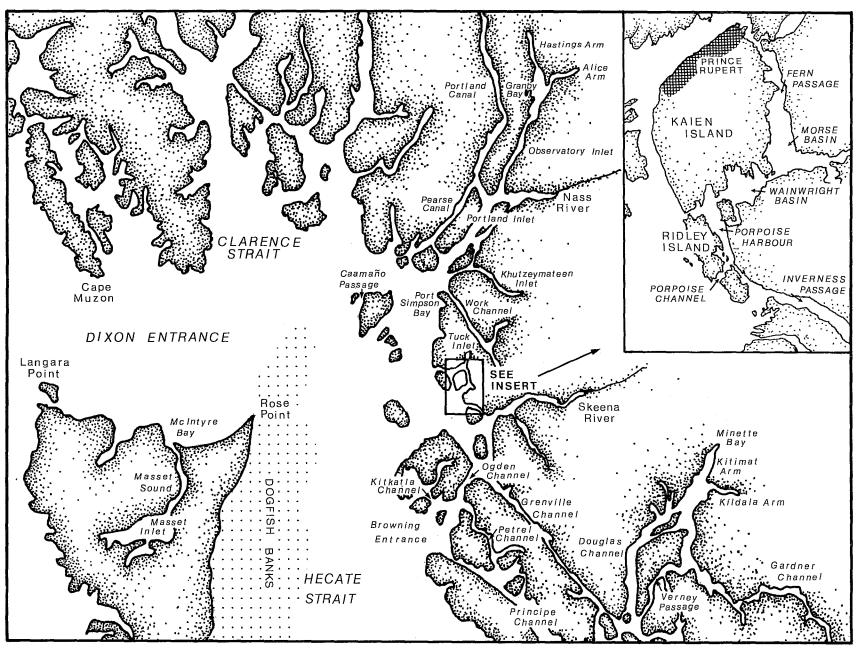


Figure 1b: Placenames for the northern half of the study area. Dogfish Banks and the City of Prince Rupert are shaded.

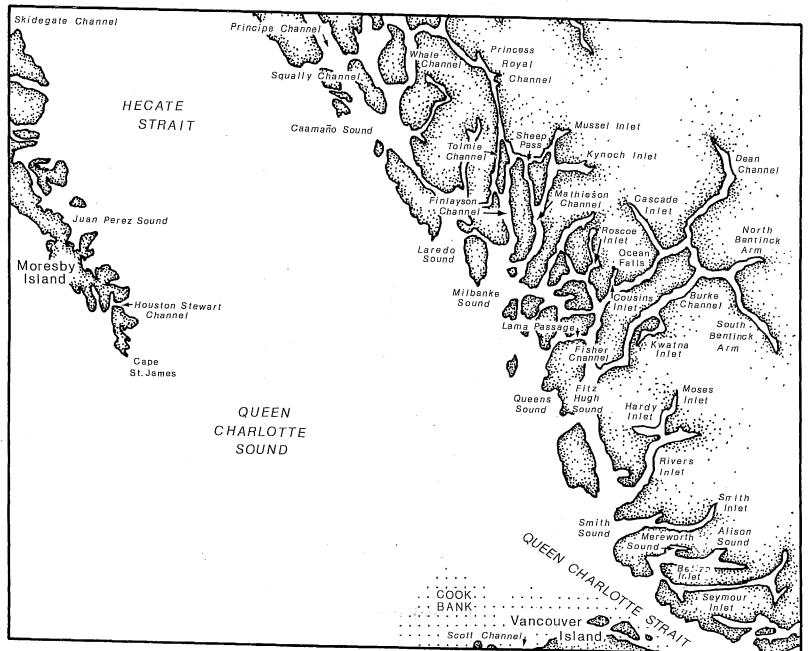


Figure 1c: Placenames for the southern half of the study area. Cook Bank is shaded.

3. HISTORICAL DATA

The early oceanographic data consist mainly of water-level measurements. These data commenced in 1903 with measurements near Prince Rupert.

In 1934, a program was begun which involved the collection of surface temperature and salinity data at shore stations, mainly at lightstations maintained by the Ministry of Transport (MOT) or its organizational equivalent. Since then, fourteen stations have been operated in this area for varying periods of time (Section 3.1).

The first oceanographic survey was made in 1934. The program was conducted by the University of Washington and consisted of several hydrographic stations in Dixon Entrance. In the late 1930's, the Pacific Biological Station (PBS) at Nanaimo began cruises in this area, followed by the Institute of Oceanography at the University of British Columbia (IOUBC) in the early 1950's (Figure 2).

The Pacific Oceanographic Group (Nanaimo) and IOUBC dominated the oceanographic activity until the late 1970's when the Institute of Ocean Sciences at Patricia Bay (IOS) was established. Since then, IOS has been largely responsible for oceanographic data collection on the west coast. Independent consulting firms also began conducting oceanographic surveys in the late 1970's. Consultants have carried out studies for both government agencies and commercial companies.

3.1 SURFACE TEMPERATURE AND SALINITY FROM SHORE-STATIONS

Daily observations of sea-surface temperature and/or salinity have been made at various west coast locations since 1934. The stations in this study area are summarized in Table 1 and plotted in Figure 3. All are lightstations presently operated by the Canadian Coast Guard except Cape St. James, which is a meteorological station operated by the Atmospheric Environment Service (AES). The data have been published in various government reports (eg: Hollister and Sandnes, 1972; Wickett and Ballantyne, 1978; Giovando, 1983a, b).

Normally, observations are made within an hour of daytime high tide. Temperature and salinity are measured near surface, approximately at 1 m depth. The water sample for salinity determination is collected using either a bucket or a sampling bottle. The temperature is obtained by "immediate" immersion of a thermometer into the water thus collected.

Following are the estimated accuracies of the various methods used to determine temperature and salinity.

A. Temperature

1.	1934-1936	Mercury thermometer	+0.5°F, +0.28°C
_	* * * * * * * * * * * * * * * * * * * *		

2. 1937-1939 Red-liquid thermometer ± 0.5 °F, ± 0.28 °C

3. 1940-present Mercury thermometer $\pm 0.3^{\circ}$ F, $\pm 0.11^{\circ}$ C

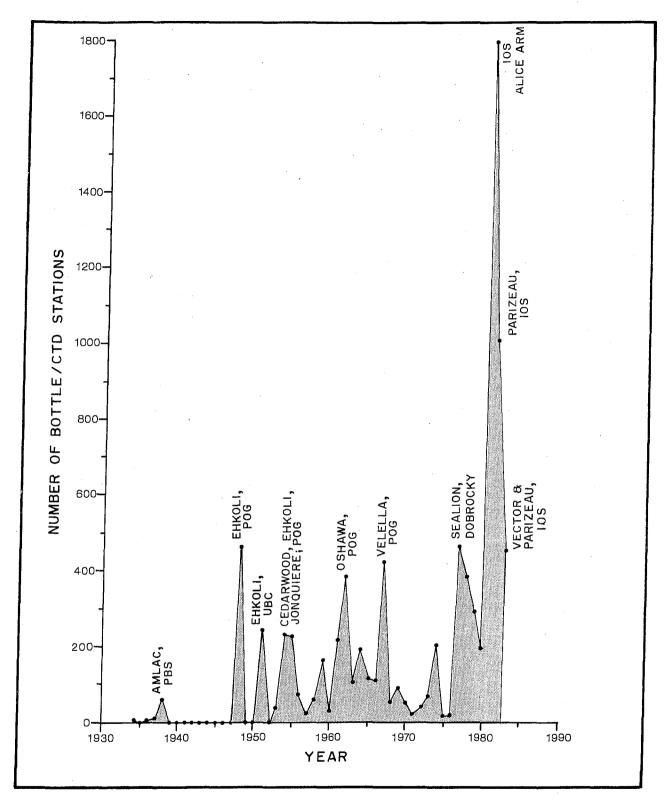


Figure 2: Level of oceanographic effort, based on number of bottle-CTD stations per year (vessel, agency).

TABLE 1: B.C. SHORE-STATIONS - SURFACE TEMPERATURE AND SALINITY

					Date of
Station	Data Set I.D.	Latitude	Longitude	Period of Operation	Conversion from Salinometer to Hydrometer
Langara Island	36-0004	54°15.3'	133°3.5'	Oct. 22/36- Aug. 28/37	
·	40-0004	54°15.3'	133°3.5'	Mar. 02/40- present	Sep. 23/69
Green Island	35-0004	54°34'	130°42'	Feb. 01/35- Sep. 14/36	
Prince Rupert	40-0005	54°19'	130°18'	Jan. 02/40- Jun. 11/42	e, in a
Triple Island	39-0001	54°17.6'	130°52.7'	Nov. 01/39- Dec. 16/70	Dec. 01/69
Masset	40-0006	54°1'	132°9'	Jan. 01/40- Oct. 31/42	
Port Clements	41-0002	53°41'	132°11'	Oct. 01/41- Aug. 31/42	
Shannon Bay	40-0007	53°39'	132°30'	Jan. 01/40- Aug. 31/41	
Sandspit	53-0018	53°15'	131°49'	Aug. 01/53- Dec. 20/56	
Bonilla Island	60-0018	53°29.7'	130°38'	Apr. 07/60- present	Jan. 01/70
McInnes Island	54-0018	52°15.8'	128°43.2'	Jul. 23/54- present	Nov. 01/69
Ivory Island	37-0008	52°16'	128°24'	Jul. 27/37- Dec. 31/55	
Cape St. James	34-0002	51°56.3'	131°0.8'	Jul. 27/34- present ¹	Jan. 01/71
Egg Island	70-0033	51°15.1'	127°49.9'	Mar. 10/70- present	Jul. 01/71
Pine Island	37-0009	50°58 '	127°44'	Jan. 14/37- present	Dec. 01/69

 $^{^1}$ Temperature readings for Jan. 1939-Dec. 1942 considered unreliable. Salinity observations were terminated May 31, 1971.

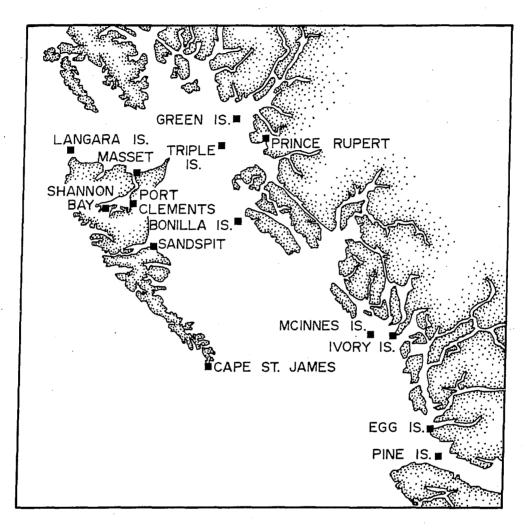


Figure 3: Shore-station locations.

B. Salinity

1.	1934-1958	Titration	+0.06°/00
2.	1959-1969 (approx.)	Conductivity salinometer	+0.02°/oo
_	Approx. 1969-present	-	+0.3º/oo

The actual dates of conversion from salinometer to hydrometer are given in Table 1.

4. GENERAL REPORT LAYOUT AND USER INSTRUCTIONS

4.1 DATA SETS

The data are organized in sets, where each set consists of data of a common type taken on a single expedition or cruise¹, usually by a single institution or organization. Thus, unless otherwise noted, all the data within a single set is assumed to have been collected in a uniform manner and should conform to a common standard of measurement.

Each data set has been assigned an identification number of the form yynnnn, where yy = last 2 digits of the year in which data were collected and nnnn = order of identification for that particular data set for that year. The data set number is a unique identifier which applies throughout the entire series of inventories; any set identified, for example, as 72-0009 is the same data set no matter where reference to it is made. Gaps may appear in the sequence of data set numbers in this inventory for a particular year, because each data set will not appear in every discipline and geographical area.

4.2 INVENTORY ORGANIZATION

Table 2 (Section 8) lists all the data sets in the inventory in order of data-set number. It provides a summary description of each set including the times, areas and methods of measurements. Table 2 also gives a listing of concurrent measurements from other disciplines.

Geographical and measurement type indexes are in Section 10. The subareas in the geographic index are shown on the map in Figure 21. Section 10 also contains an index of references, ordered by data set number. It is primarily an index of original data reports, although ancillary papers analyzing or discussing the data are listed if they came to our attention.

Measurement locations are plotted in a series of maps in Section 9. Six different maps, all in Lambert Conformal Conic projection, have been used to plot stations. In most cases, the overall map of the entire study area is used, along with one or more of the larger-scale maps. The coastlines have been smoothed, and small islands removed, to avoid clutter. Map specifications and a key to the symbols on the maps are presented at the beginning of Section 9.

¹In some cases, where similar sampling techniques were used, several cruises have been grouped into one data set. This was done prior to the commencement of this study. In these cases, letter suffixes have been used to differentiate different cruises.

Detailed listings of the times and locations of individual measurements are in Section 11. There is a separate listing for each data type. The format of the listings is explained at the beginning of Section 11.

Data sets were rated according to the criteria in Section 5. The ratings are listed in Table 2. Appendix 1 contains comments explaining the reasons for low ratings, a list of any errors found in each data set, and any other pertinent remarks concerning the data. The comments are ordered by data-set number.

Section 6 contains a general description of the extent of the data available in this area. Sections 6.1 and 6.2 describe their geographical seasonal distribution. Section 6.3 tabulates instances of repeated measurements in the same area, and instances where measurements were carried out simultaneously, in different areas, or by different agencies.

4.3 SAMPLE USE OF THE INVENTORY

A typical use of the inventory might be as follows:

- 1. Examine the maps in Section 9 for measurements during the year(s) of interest, and note the data-set numbers of interest.
- 2. Refer to Table 2 to find the range of measurement dates, measurement methods, accuracies and data sources.
- 3. If more specific information is required concerning the timing or location of individual measurements in the set, refer to Section 11.
- 4. Consult the reference index in Section 10 for works referring to or using the data.

5. DATA RATING AND APPRAISAL

5.1 TYPES OF DATA

5.1.1 BOTTLE CAST DATA

These data consist of temperature and salinity measurements at discrete depths (ideally the international standard depths) obtained by means of reversing thermometers and sampling bottles. Temperature accuracies of $\pm 0.01^{\circ}\text{C}$ may be achieved by averaging two or more carefully read, well-calibrated thermometers. Some investigators have used hydrometers ($\pm 0.2^{\circ}$ /oo) and refractometers ($\pm 0.5^{\circ}$ /oo) for the determination of salinity, but up to 1960 salinity was usually obtained by titrating water samples drawn from the bottles; replicate titrations in the hands of a good operator could yield results precise to $\pm 0.01^{\circ}$ /oo. In the 1960's, salinometers measuring salinity via the conductivity of the sample replaced titrations. A precision of $\pm 0.003^{\circ}$ /oo can be obtained with the better instruments, although in the past, systematic errors of $\pm 0.02^{\circ}$ /oo or more could be introduced by variations in the standard water used to calibrate the instruments. New international standards for salinity should eliminate the latter source of error (Lewis and Perkin, 1978).

5.1.2 **C**TD DATA

CTD data are data produced by in-situ profiling instruments variously called STD (salinity-temperature-depth), STP (salinity-temperature-pressure), CTD (conductivity-temperature-depth) or CTP (conductivity-temperature-pressure) profilers. Fundamentally, all are CTP devices; the variations in output and name depend solely upon the degree of internal data processing. All instruments perform the same basic function of measuring (more or less continuously) temperature and conductivity as a function of depth. The precision achievable with such devices depends upon the individual instrument. The best are capable of a precision of $\pm 0.005^{\circ}$ C and $\pm 0.005^{\circ}$ /oo, although accuracy in salinity, until recently, was limited to approximately $\pm 0.02^{\circ}$ /oo because of the inconsistencies in salinity standards and definitions (Walker and Chapman, 1973).

5.1.3 BATHYTHERMOGRAPH

The bathythermograph (BT) is a thermo-mechanical device which measures water temperature as a function of pressure. Its information is recorded as a trace, on a smoked-glass or gold-coated slide, which can be read to an accuracy of $\pm 0.2^{\circ}\text{C}$ and ± 2 m depth if the instrument is well calibrated. The BT was widely used in conjunction with bottle casts but has largely been superseded by the CTD. XBT's are the expendable variety. BT data have not generally been compiled, unless they were accompanied by other physical oceanographic measurements. The Pacific Biological Station (PBS), Nanaimo, collected large amounts of BT data beginning in the 1950's and most of these data are on file with the Marine Environmental Data Services Branch of the Department of Fisheries and Oceans (MEDS). The 1977-1981 BT data are published in Dodimead et al. (1979a, b) and Dodimead and Ballantyne (1980, 1984).

5.1.4 SELF-RECORDING CURRENT METERS

By the 1970's oceanographers could practically and reliably place and recover self-recording current meters in the water column. Meters of this type generally record internally on magnetic tape (in some models photographic film or paper charts are used), or telemeter data to a ship or to a shore receiving station. They generally provide time series of current speed and direction, and may have other sensors (for measuring temperature, pressure or conductivity) mounted as well. Current speed and direction are usually measured by one of two methods: either by a propeller or rotor for measuring speed and a vane for direction sensing, or by a measurement of two orthogonal components of the current speed. Component speeds may be measured by propel lers, or by electromagnetic or acoustic speed sensors. Directional reference is usually provided by a magnetic compass. Commonly used instruments employing the propeller and vane system are the Aanderaa, Hydroproducts, Endeco and AMF (vector-averaging) current meters; those employing the component-measuring system are the Cushing and Marsh-McBirney instruments (electromagnetic), the Neil Brown (acoustic), and the Davis-Weller (orthogonal-propeller) instruments.

The precision and accuracy of current meters depend to a great degree both on the design of the instrument, and on the environment in which it is used. Serious problems may be encountered if rotor-type meters are used in the wave zone. Calibration drift and sensor fouling can interfere with satisfactory operation of electromagnetic and acoustic sensors. The sampling frequency and integration period selected for the meter can also affect the accuracy of the record.

5.1.5 PROFILING CURRENT METERS

These current meters provide a series of point measurements of current speed and direction at several depths throughout the water column. Meters used for this purpose are generally of the propeller or rotor and vane design, the oldest common example being the Ekman-Merz meter. Measurements usually are taken from an anchored ship in shallow water. In water too deep for anchoring, a very good positioning system is required to correct for ship movements. Unless repeated profiles were taken so as to form a time series, this type of data was not generally catalogued. Recently Cyclesondes have been used for profiling. This instrument can be fitted to measure currents as well as other parameters, and oscillates vertically up and down a tether, unattended.

5.1.6 CURRENT DRAGS

This method of current determination was employed primarily in the 1950's and early 1960's. A tethered drogue was allowed to drift away from the anchored vessel. The time for a measured length of line to pay out provided a measure of current speed. The direction of flow was estimated from the course of the drogue. The drogues were typically crossed metal vanes, having slight positive buoyancy. Accuracy of speed and direction were seldom discussed. It is believed that speed measurements should be accurate to +5 cm/s or better. The accuracy of the direction measurement would vary depending on what method was used. For example, a compass reading should provide a reading to +5° or so, whereas an estimate based on land features and chart would generally not be this accurate.

5.1.7 RADAR OR AIRCRAFT-TRACKED DRIFTERS

This type of drifter usually consists of a float (with or without a drogue) and a radar reflector or visual marker. These devices can be tracked visually or by radar from shore or from a ship or aircraft. The accuracies achievable depend upon the tracking system used, and can be very good if a sophisticated system is available. Data of this type are often limited in their coverage in space and time, and may have gaps resulting from bad weather.

5.1.8 SATELLITE-TRACKED DRIFTERS

Satellite-tracked drifters are a comparatively recent invention, dating from the early 1970's. Widespread use of these devices began after the launch of the Nimbus VI satellite carrying the Random Access Measurement System (RAMS) in 1975. In early 1979, the TIROS-N satellite was launched activating Service ARGOS which is now used to track all such devices.

Both RAMS and System ARGOS compute position from the Doppler shift of a signal transmitted from the buoy to the satellite. On each pass of the satellite the position (and any other data being measured) is received and sent to a ground facility where the data are processed. Both the RAMS and ARGOS systems produce positional accuracies of approximately ± 2 km.

Recently it has become possible to use the LORAN-C system to track drifters (data set 84-0006).

5.1.9 WATER LEVEL GAUGES

Water-level data are produced mainly by visual observation of tide staffs, by mechanical shore-mounted float-type gauges, or by bottom-mounted pressure gauges. Some early data consist only of observations of the times of high and low water levels. The pressure gauges may be self-contained, or they may consist of a pressure sensor connected to a shore-mounted recording device. The mechanical gauges record by means of a pen on chart paper. The data are usually digitized at hourly intervals, resulting in a record with a resolution of approximately +1 cm, and an accuracy of the order of +5 to The resolution of the bottom-pressure gauges varies from a millimetre to a centimetre, depending upon the instrument type and range. Sampling intervals generally vary between 5 and 60 minutes. Bottom pressure gauges generally record total pressure, atmospheric plus hydrostatic. In order to extract the water level fluctuations due to changing atmospheric pressure (i.e. the inverted barometer effect), the atmospheric pressure must also be The Canadian Hydrographic Service (CHS) has collected most of the water-level data; such information was first recorded in 1903. The four-digit station identities used by CHS have been cross-referenced with the common name and the data set ID number in Table 3 of Section 11.3

5.1.10 WAVE RECORDERS

There are three basic types of wave-measuring devices for measurement from a single point:

- a) Surface-piercing instruments. These are fixed relative to the water level and measure surface motion using various methods such as the change in capacitance of a vertical wire.
- b) Pressure-measuring devices. Ocean waves produce measurable pressure fluctuations beneath them which, under proper conditions, can be related to wave height.
- c) Instruments which measure the vertical acceleration of the water surface. When integrated twice in time, the vertical acceleration yields seasurface elevation relative to the mean.

In shallow water, types a) and b) are generally used, whereas type c) is more suited to deeper waters. Generally, Waverider accelerometer-type buoys have been used in most studies off the Canadian west coast.

5.2 DATA RATING SCALE

5.2.1 RATING CRITERIA

The data appraisal in this inventory is intended to provide the reader with an indication of the quality of each data set and its suitability for comparison with other data sets. The appraisal was based primarily on documentation describing the methods used in collecting and processing the data and the investigator's estimate of their precision, accuracy and utility. Subsequent analyses of the data were also taken into account, e.g. if errors were found in a particular data set during a subsequent analysis, and the results were published, these results were used in the assessment. Note that a thorough appraisal, requiring investigation of the data and comparisons with other data sets, is beyond the scope of this report.

The information from the sources above was used to assign a numerical rating to each set. The rating system has five levels, defined as follows:

- O: Data are found to be wrong.
- 1: Data are suspect because of ill-defined doubts.
- 2: Data quality could not be determined due to insufficient support documentation.
- 3: Data are internally consistent patterns or trends within the data themselves are probably real, but comparison with other data sets may pose problems.
- 4: Data are internally consistent and exhibit sufficient standardization that comparison with other 4-rated data should be possible.

5.2.2 ASSIGNMENT OF RATINGS

0 RATING

A data set received a $\underline{0}$ rating if serious deficiencies in technique, or significant systematic errors, occurred. A $\underline{0}$ rating was also assigned if the documentation of the data set lacked essential information (e.g. the positions and times of measurements) which no longer exists.²

1 RATING

A data set received a 1 rating if, either as part of a data report or in subsequent analysis and examination, the original or other investigators questioned the validity of the data without pinpointing specific errors. In general, a 1 rating was assigned if a data set exhibited an atypical distribution of values, or indicated unlikely physical processes, but contained no obvious errors. Such data sets require careful examination before use.

2Note that this definition of this number has been modified from that used in Volumes 1, 3 and 5 of the Arctic Data Compilation and Appraisal Series, in order to emphasize that data sets assigned a <u>O</u> rating are either wrong or of very limited value due to lack of documentation.

2 RATING

Ratings of $\underline{2}$ were given to data sets for which it was not possible to carry out an appraisal. Such cases include:

- (i) Proprietary data, whose existence is known, but about which no details are available.
- (ii) Data sets for which we were unable to obtain documentation but know that data were collected.

3 RATING

Data received a 3 rating if they were internally consistent within the precision of the methods used to collect the data. Precision refers to the degree of random fluctuation experienced when a measurement is repeated many times, while accuracy is the departure of the measurement (or the mean of a series made under controlled conditions) from the true value. Because oceanographic data are normally taken without replication and under uncontrolled conditions, data taken with instruments of a certain precision will have the same (or poorer) level of accuracy. An exception is the case of a series of temperature-salinity measurements taken within a water body of stable, well-defined characteristics, in which case the mean of the series could provide a measurement more accurate than the precision.

Ratings of 3 were given to all data sets for which no evidence of errors beyond the precision given in Table 2 was found, but which did not satisfy each of the criteria required for a rating of 4 (see below). This is based on data reports and other publications; the actual data were not checked further by these authors. In some instances, the instrument and/or precision and accuracy were unknown, but the collecting agency used standardized methods; these data sets were generally awarded a 3 rating when there was no evidence suggesting deficiencies in the data.

Caution should be exercised when comparing two sets of 3-rated data, as their levels of precision may be quite different. The reader should consult both Table 2 and Appendix 1 for precision and error information.

4 RATING

Data received a rating of $\underline{4}$ if: they were measured to the precision available with modern methods described in Section 5.1; they had no evidence of systematic or other errors recorded in the documentation; and they were obtained using measurement instrumentation, methodology and techniques which provide data that can be related to national or international standards.

Since standards tend to change, ratings of $\underline{4}$ were only grudgingly awarded. In many cases, ratings of $\underline{3}$ were assigned because of lack of time and/or sufficient documentation to be certain that a rating of $\underline{4}$ was warranted. Some of these ratings may merit an increase to $\underline{4}$ after further study of the data has been made.

Of all the physical oceanographic data that were inventoried, the bulk of the data is temperature/salinity measurements. Until the early 1960's, water samples were collected by bottle cast and salinities were determined by titration. During most of the 1960's, salinities were generally determined using conductivity bridges. From the late 1960's on, instruments which measured conductivity and temperature in situ (CTDs) became the standard. Salinity was then computed from the temperature and conductivity values.

CTDs with increased resolution have revealed gradations in salinity where previous chemical analyses indicated homogeneous water. Since both bottle and CTD data may have ratings of 3, caution must be used in any comparison.

Salinity determination depends on a standard. In the past this was $35^{\rm o}/{\rm oo}$ Copenhagen water. However, variability in the standard and in the calibration of the instrumentation often resulted in systematic errors of $0.02^{\rm o}/{\rm oo}$ or more.

A new, practical salinity scale has recently been adopted (Lewis and Perkin, 1978). A conductivity ratio is measured (the conductivity of the unknown to that of a standard laboratory-produced sample). Waters of the same conductivity ratio at a given temperature and pressure are then defined to have the same salinity. This reduces systematic errors in salinity. However, most of the historical data remains subject to a $\pm 0.02^{\circ}/oo$ accuracy limitation.

Current-meter data were judged by the instrument characteristics, response, and the deployment methods. The main causes of low ratings are directional errors and contamination by mooring motion and wave-orbital velocities.

6. SUMMARY OF DATA COVERAGE

6.1 SPATIAL COVERAGE, INCLUDING DATA DISTRIBUTION MAPS

The locations of all measurements compiled to date are summarized for bottle/CTD (Figure 4), current-meter (Figure 5), water-level (Figure 6), and wave data (Figure 7).

The location maps of all temperature-salinity data have been split into pre-1970 (Figure 4a) and post-1970(Figure 4b). Prior to 1970, most temperature-salinity data were obtained using bottle casts. Standard depths at which data were collected were 0, 10, 20, 30, 50, 75, 100, 150, 200, 300, 400, 500, 600 m. Most of the post-1970 data were obtained using in-situ profiling instruments having vertical resolution on the order of centimetres. Temperature-salinity stations are most concentrated in Dixon Entrance, southern Queen Charlotte Sound, Cook Bank, and the major inlets. Hecate Strait and the nearshore and coastal channels adjoining Hecate Strait and Queen Charlotte Sound have not been as heavily sampled. Apparent in Figure 4 are lines of stations across Queen Charlotte Sound and Hecate Strait. These are lines traditionally occupied by oceanographic surveys.

Figure 5 shows the locations of all current measurements in this area. Such measurements include those obtained from both moored current meters and profiles, carried out from a vessel at anchor. The Douglas Channel system was well covered by the Dobrocky Seatech Ltd. study (77-0042), and Burke

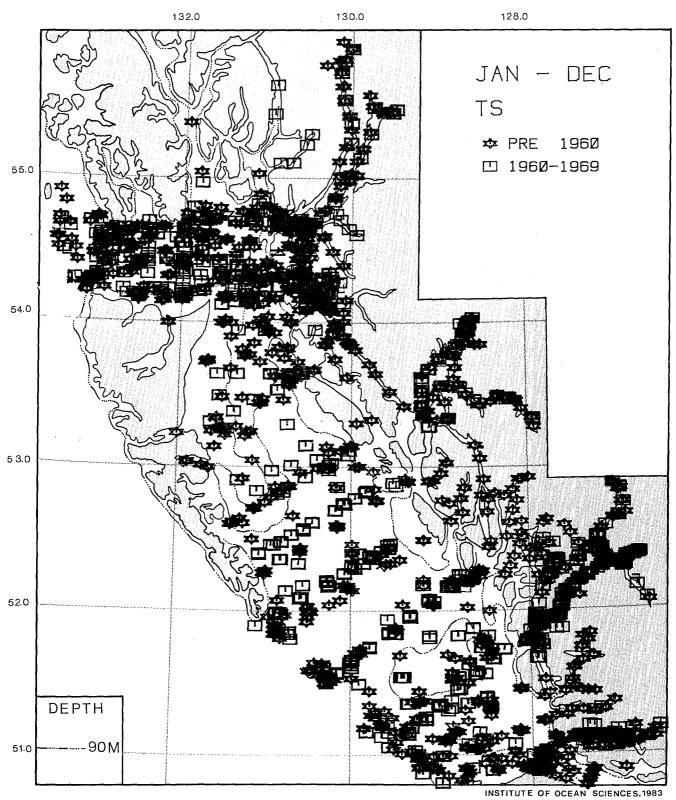


Figure 4a: The locations of all temperature-salinity measurements made pre 1970 (approx. 3300 stations).

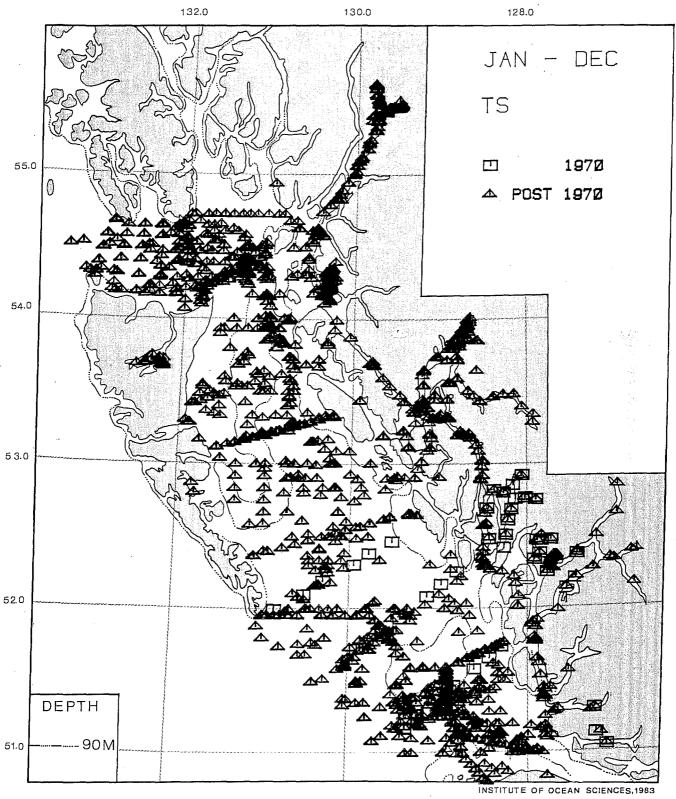


Figure 4b: The locations of all temperature-salinity measurements made from 1970 through 1984 (approx. 5400 stations).

Channel/N. Bentinck Arm by the Pacific Oceanographic Group in 1967 (67-0023) using the barge $\underline{\text{Velella}}$. More recently, current meters have been moored in Queen Charlotte Sound, Dixon Entrance, Alice Arm and Hecate Strait.

The geographical distribution of water-level stations is fairly uniform, although most are coastal or nearshore (Figure 6). Only recently have offshore water-level records been obtained.

Wave measurements have been made in Dixon Entrance, Hecate Strait, Queen Charlotte Sound, Observatory Inlet, and near Prince Rupert and Kitimat (Figure 7). The earlier (1968) data in Hecate Strait were obtained from drilling rigs, while the recent offshore data were obtained using Waverider or similar-type buoys.

6.2 SEASONAL COVERAGE, INCLUDING BI-MONTHLY MAPS

Bi-monthly station maps have been produced for temperature-salinity data (Figures 8-13), and for current and water-level data (Figures 14-19). In each figure the locations of available measurements are plotted according to the two-month period in which the data were obtained, beginning in January-February, and continuing through to November-December. In general, more data were collected during spring and summer, than in fall-winter.

Temperature/Salinity

The inlets and fjords have been sampled most heavily during the May-August period. The Kitimat and Observatory Inlet/Alice Arm systems have been covered thoroughly, with stations taken during each bi-monthly period. Offshore, most data have been obtained during April-October. The amount of data drops off during the winter, reaching a minimum during the November-December period. This is due to the stormy conditions often existing in these waters during winter.

Current

Similar to the T/S distribution, current data in the inlets are concentrated in the Burke Channel, Douglas Channel, and Observatory Inlet/Alice Arm systems. However, only Observatory Inlet/Alice Arm and Douglas Channel have been sampled in each bi-monthly period. Recent programs by IOS have resulted in current records year-round for Hecate Strait, and April-October records for Dixon Entrance.

Water-Level

The most obvious gap in water level coverage is winter data offshore in Queen Charlotte Sound and Hecate Strait. Coverage by more-easily maintained nearshore stations is generally widespread and year-round.

6.3 SYNOPTIC DATA SETS AND EXTENDED TIME SERIES

Synoptic Data Sets-Temperature/Salinity Data

In some years, the existence of two or more data sets collected at the same time provides a combined data set with near-synoptic coverage over a relatively large area. Data sets were considered near-synoptic if their

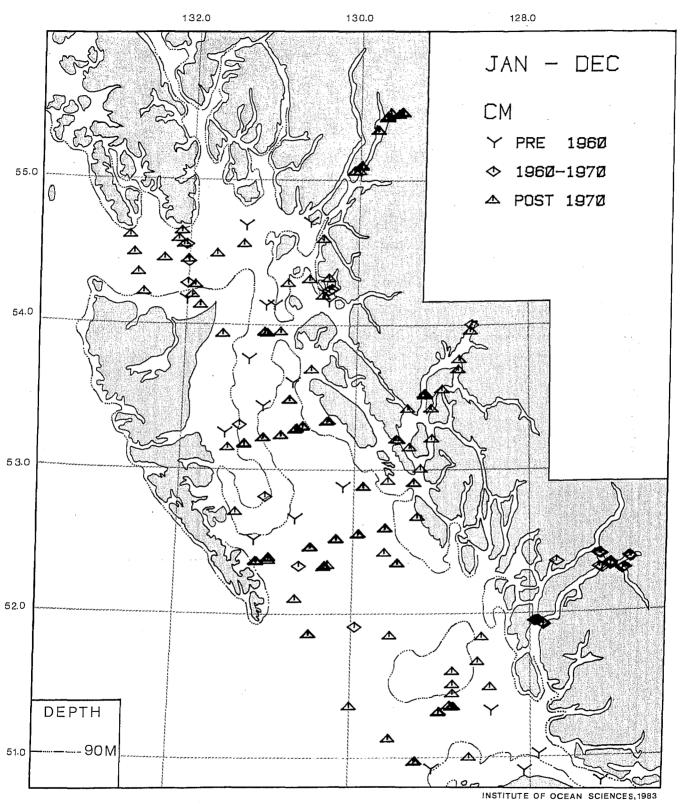


Figure 5: The locations of all current-meter measurements (560 CM records).

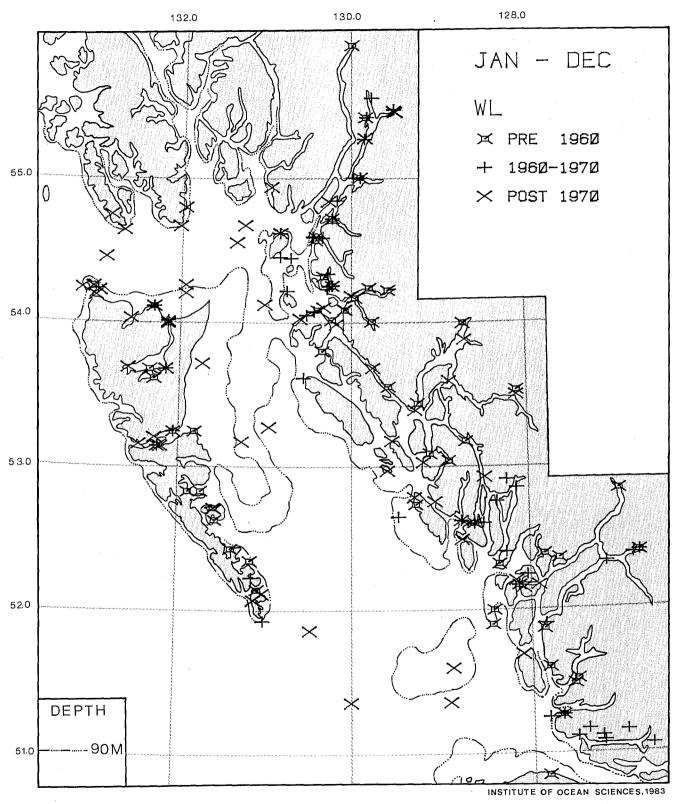


Figure 6: The locations of all water-level measurements (220 stations).

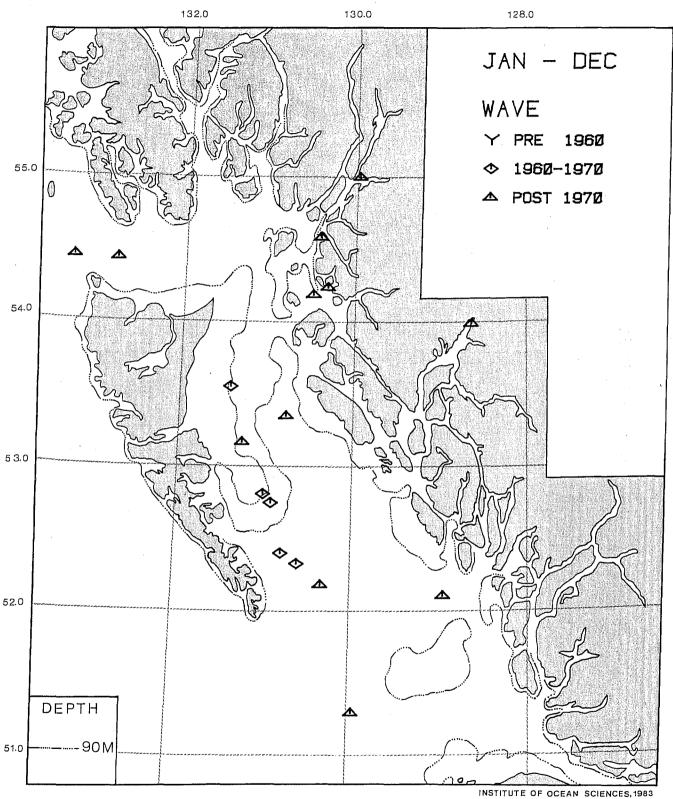


Figure 7: The locations of all wave measurements (17 stations).

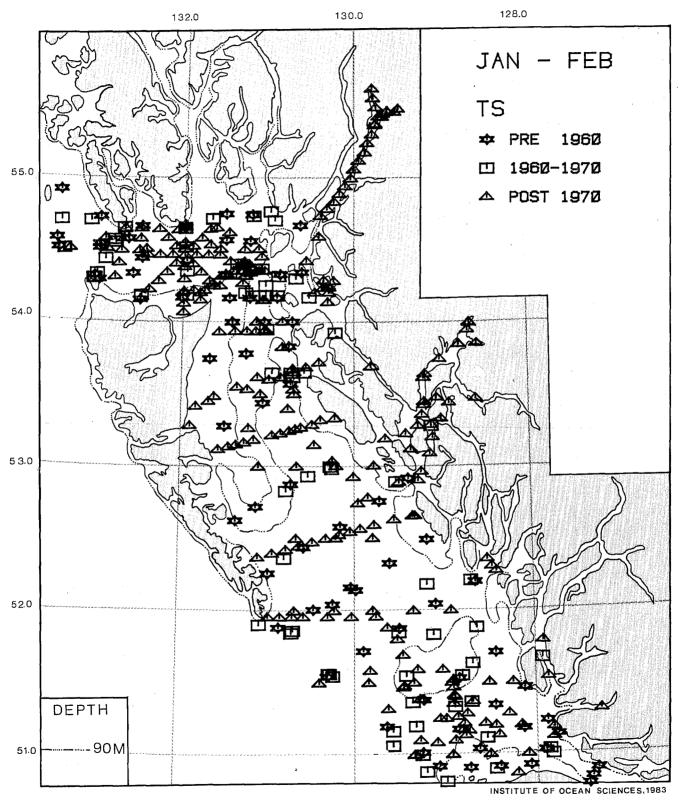


Figure 8: The locations of temperature-salinity data collected during the January - February period, all years (503 stations).

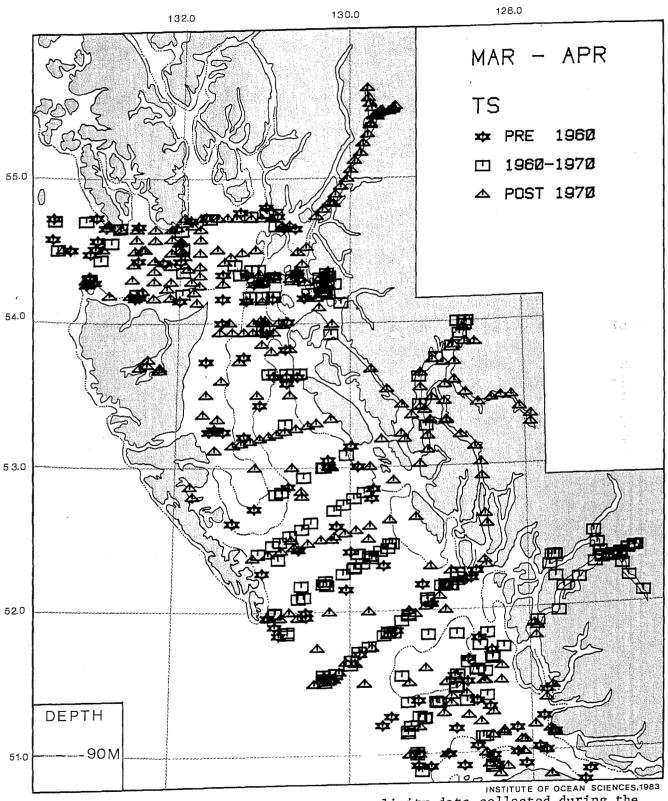


Figure 9: The locations of temperature-salinity data collected during the March - April period, all years (719 stations).

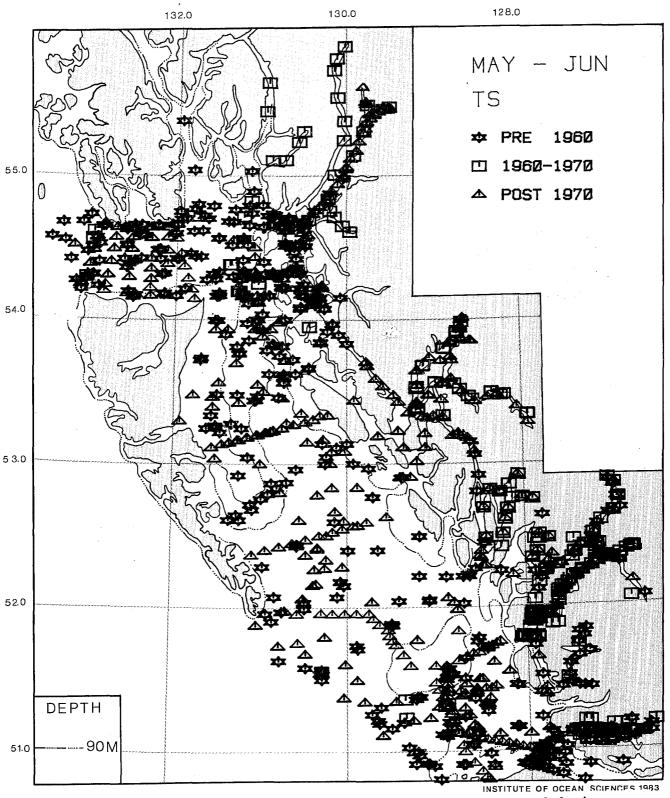


Figure 10: The locations of temperature-salinity data collected during the May - June period, all years.

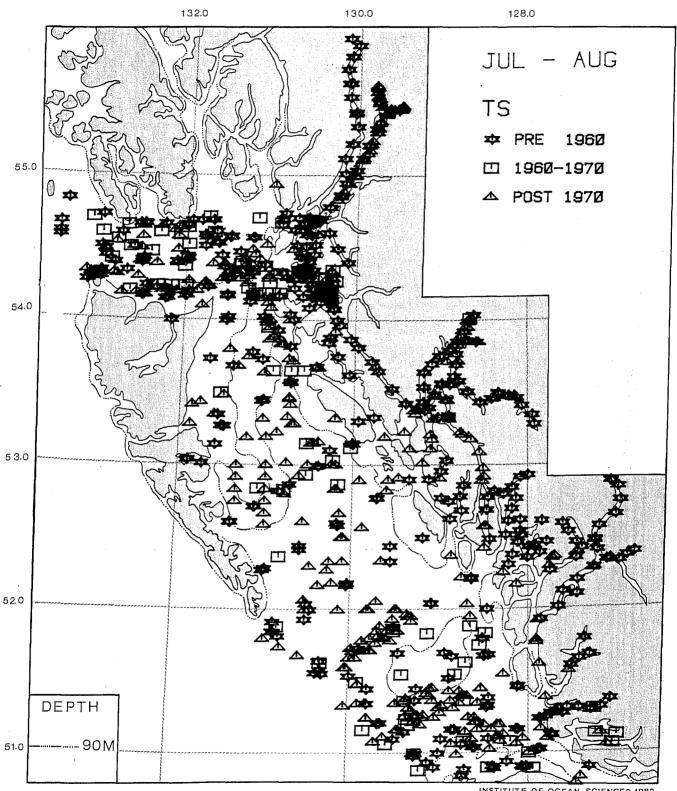


Figure 11: The locations of temperature-salinity data collected during the July - August period, all years (945 stations).

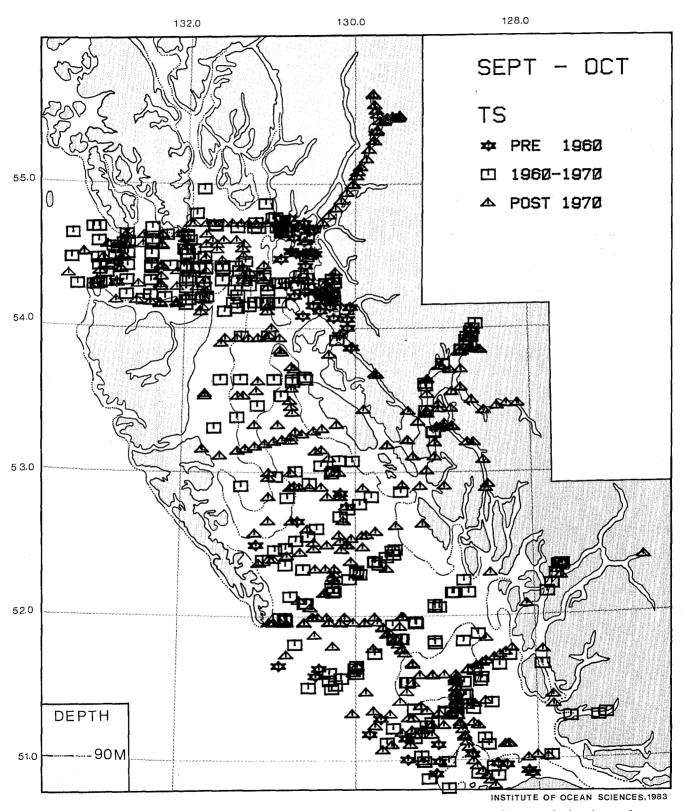


Figure 12: The locations of temperature-salinity data collected during the September - October period, all years (820 stations).

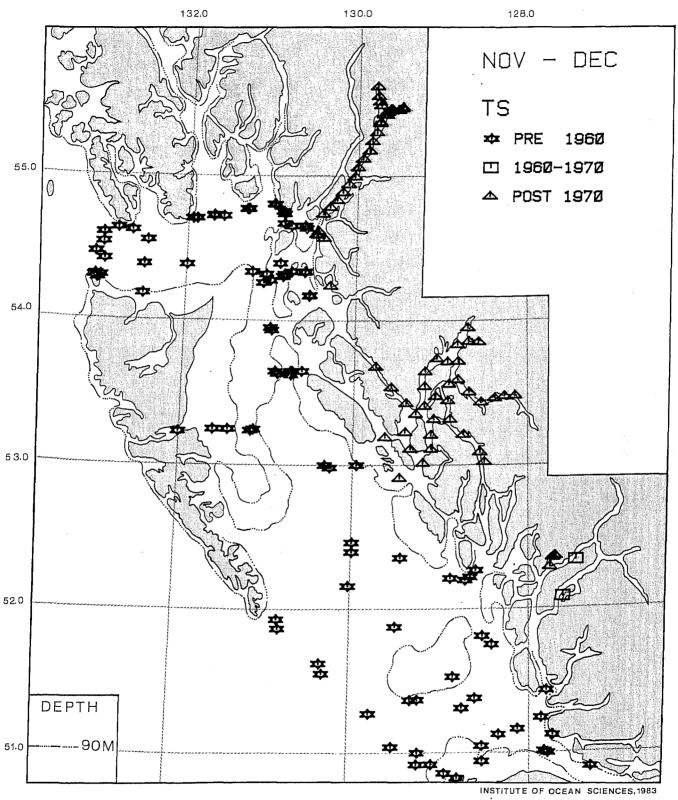


Figure 13: The locations of temperature-salinity data collected during the November - December period, all years (215 stations).

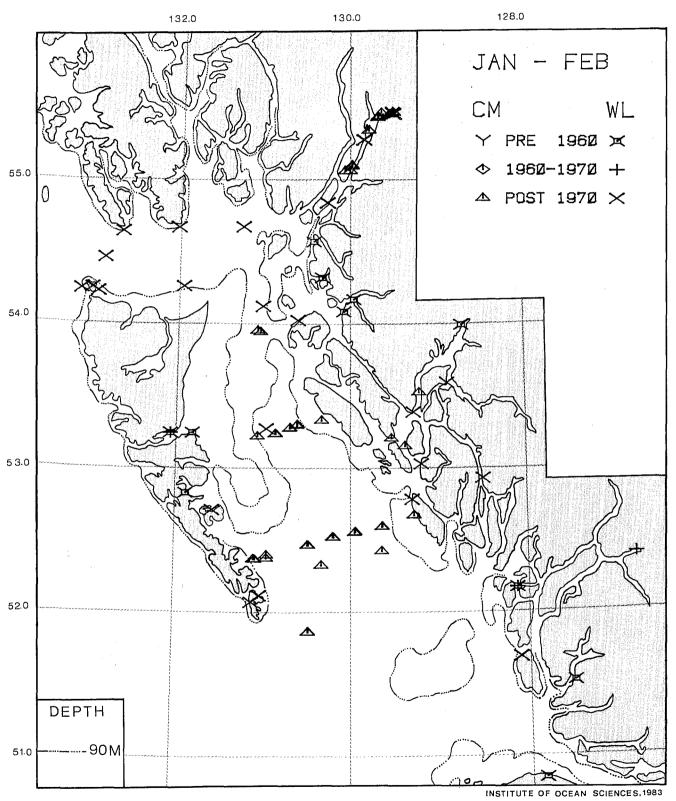


Figure 14: The locations of all current-meter and water-level stations in place during the January - February period, all years (137 CM, 51 WL).

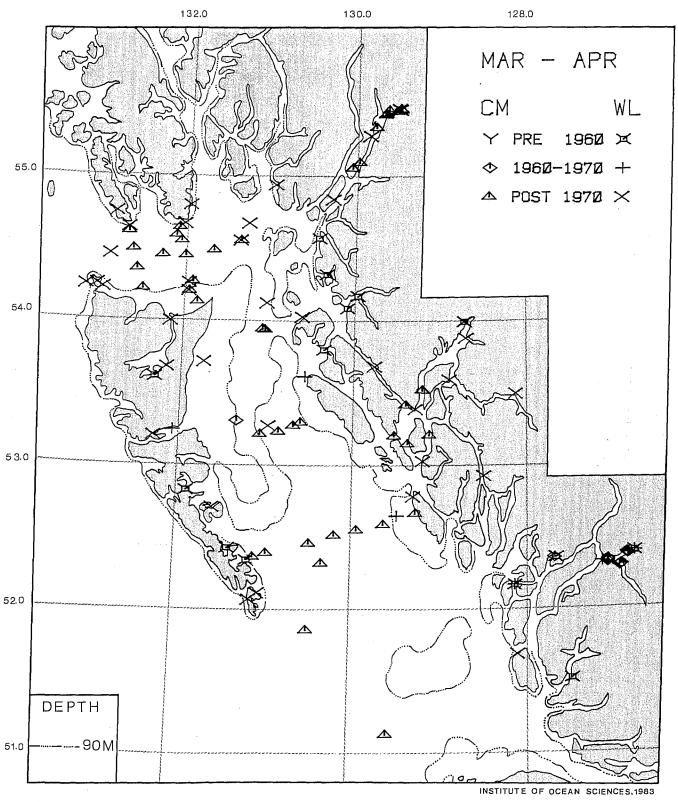


Figure 15: The locations of all current-meter and water-level stations in place during the March - April period, all years (161 CM, 69 WL).

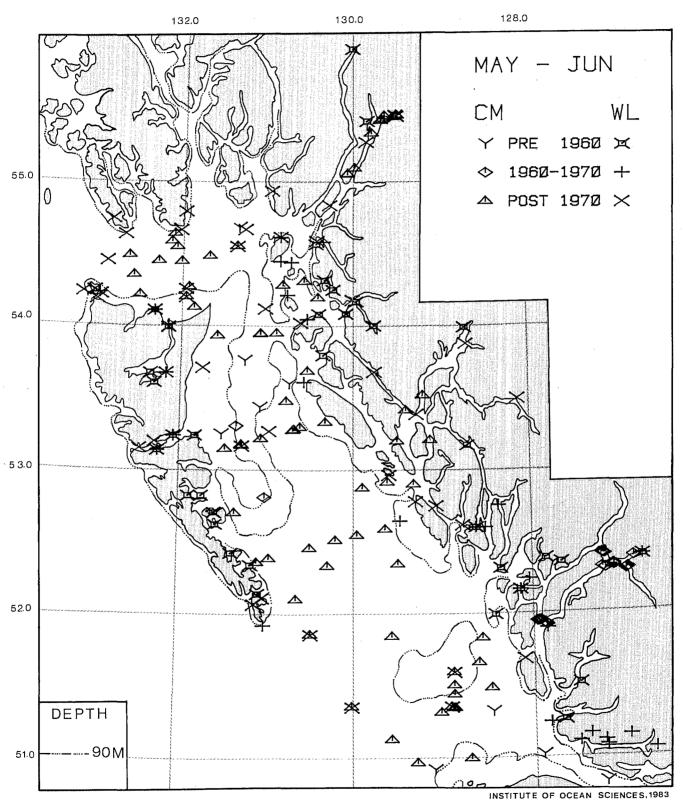


Figure 16: The locations of all current-meter and water-level stations in place during the May - June period, all years (241 CM, 136 WL).

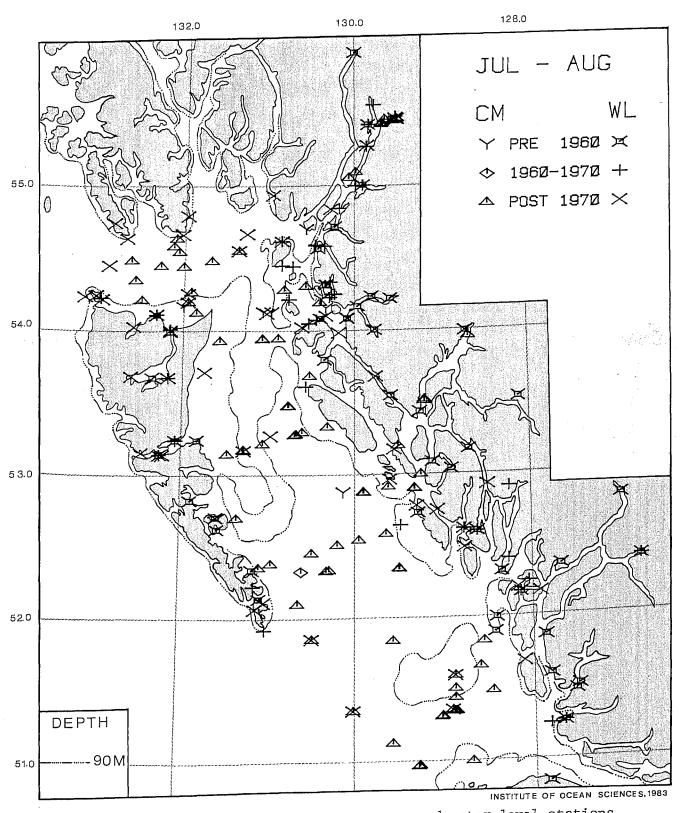


Figure 17: The locations of all current-meter and water-level stations in place during the July - August period, all years (207 CM, 163 WL).

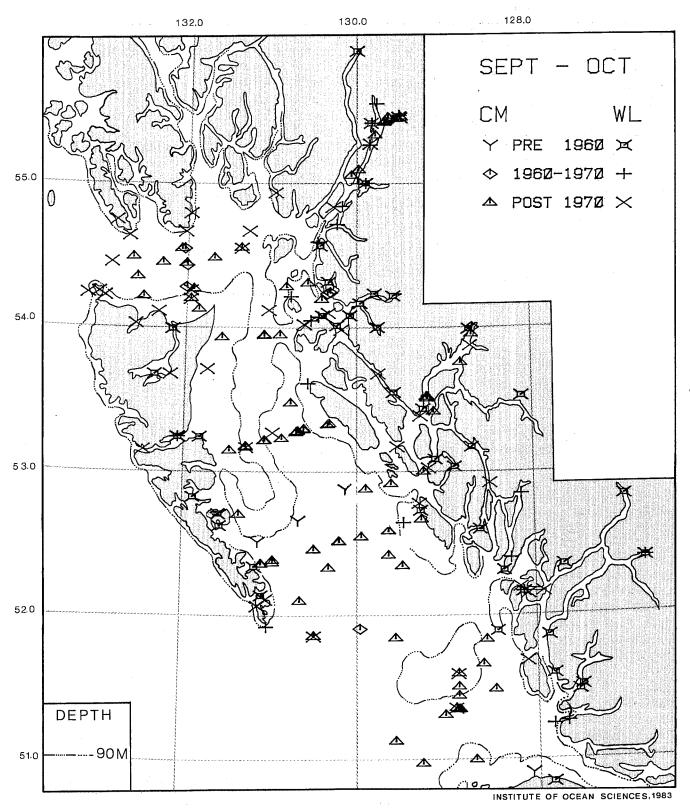


Figure 18: The locations of all current-meter and water-level stations in place during the September - October period, all years (263 CM, 141 WL)

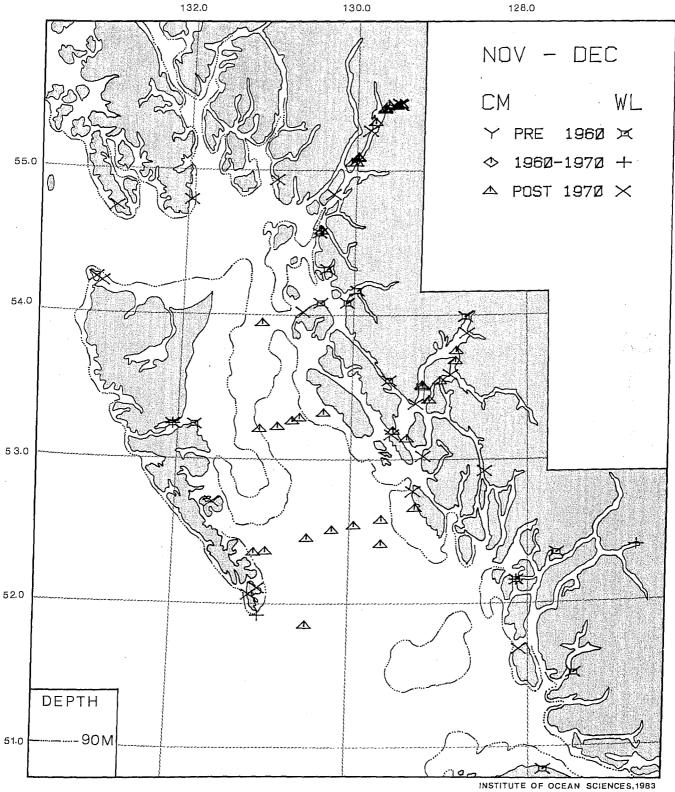


Figure 19: The locations of all current-meter and water-level stations in place during the November - December period, all years (122 CM, 52 WL).

measurement periods overlapped significantly. The combined data sets may improve coverage within a given area, extend coverage to a larger area, or allow comparison of simultaneous processes in different areas. The shore station data discussed in Section 3.1 are periodically synoptic. These data are not included here. Listed below are near-synoptic data sets by year and general area of coverage. Only temperature/salinity data are considered. Data sets followed by a question mark indicate uncertainty in the time period or location of the measurements. Synoptic groupings within the same year are separated by a solid line.

List of Near-Synoptic Data Sets

Data Set ID	Area	Data Set ID	Area
1963		1977	
63-0011A	Burke Channel, Dean Channel	77-0042A 77-0057B	Douglas Channel System Hecate Strait
63-0018	Burke Channel, North Bentinck Arm	77-0042B 77-0057C	Douglas Channel System Hecate Strait
1982		1983	
82-0025A	Alice Arm, Portland Inlet	83-0015	Alice Arm, Observatory Inlet
82-0036	Alice Arm, Observatory Inlet	83-0037	Alice Arm
82-0061	Alice Arm		
82-0039B	Alice Arm		
82-0064	Alice Arm		
82-0040	Alice Arm,		
	Observatory Inlet		
82-0067	Alice Arm		

Extended Time Series

Repeated measurements in the same area may allow long-term trends to be detected and variability to be estimated. Repeated temperature and salinity measurements have been made in several areas. The listing on the following page provides, by area, extended series of data sets. The shore station data also form extended time series; refer to Section 3.1.

6.4 CONCLUSIONS

This catalogue of physical-oceanographic data for the coastal waters off British Columbia allows scientists and others to determine the coverage and quality of data in any given area. One of the most striking conclusions of this report is the large amount of relatively good temperature-salinity and water-level data that have been collected: approximately 8,500 temperature-salinity stations and 200 extended time series records of water-level. Good long-term current and surface-drift data are not as plentiful; however recent programs by the Institute of Ocean Sciences have significantly lessened this deficiency.

Extended Time Series of Temperature-Salinity Data

Dixon Recate Sound	Dixon Hecate Queen Charlotte Parpoise Harbour Observatory Inle	·t-
34-0001 51-0012 36-0003 80-0051A 64-0012 51-0009 82-0064 37-0004 53-0015B 50-0006 80-0051B 67-0008 66-0013 82-0066 38-0002 54-0012A 51-0012 80-0051C 71-0028 74-0042 48-0009 34-0012B 51-0016 80-0051D 72-0037 76-0050 83-0003A 51-0012 54-0012C 53-0015B 82-0068 73-0031 76-0062 83-0003B 51-0016 55-0013 54-0012A 82-0068 73-0031 76-0062 83-0003B 51-0016 55-0013 54-0012A 82-0068 73-0032 76-0063 83-0015B 53-0015B 55-0020 54-0012B 83-0002A 77-0040A 77-0059 83-0015B 54-0012C 58-0009 55-0013 54-0012C 83-0036A 74-0040A 77-0076 83-0035B 55-0012 59-0011B 55-0020 74-0040A 77-0077 83-0039 55-0013 59-0011B 55-0020 74-0040A 77-0078 83-0039 55-0021 59-0011B 55-0020 74-0040A 77-0078 83-0039 55-0020 59-0011B 55-0020 77-0077 81-0018 57-00078 60-0012 57-0007A 77-0058 80-0043B 77-0078 57-0009 61-0017B 58-0009 72-0036B 80-0052 81-0054 58-0009 61-0017B 58-0009 72-0036B 80-0052 81-0054 58-0009 62-0015 59-0011A 74-0050A 74-0050B 81-0057 59-0011B 62-0025 60-0011 74-0050A 82-0065 81-0055 59-0011B 62-0025 60-0012 74-0050B 82-0065 81-0059 61-0017 77-0057B 67-0017B 68-0017B 67-0017B 68-0017B 67-0017B 68-0017B 67-0017B 68-0017B 67-0017B 68-0017B 88-00051B 68-0017B 68-00	Entrance Strate	. —
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38-0002 54-00124 51-0012 80-00510 71-0028 74-0042 82-0063 83-00034 88-0009 54-00128 51-0016 55-0013 54-00128 53-00158 82-0051 72-0037 76-0062 83-00038 83-00038 83-00038 83-00158 55-0020 54-00128 83-00024 73-0032 76-0063 83-00158 53-00158 55-0021 54-00128 83-00024 73-0047 77-0076 83-0015 74-00428 55-0021 54-00128 58-0008 54-00120 83-00364 74-00404 77-0076 83-0037 74-00408 77-0076 83-0037 74-00408 77-0076 83-0037 74-00408 77-0078 83-0039 74-00408 77-0078 83-0039 74-00408 77-0078 83-0039 74-00408 77-0078 83-0039 74-00408 77-0078 83-0039 74-00408 77-0078 83-0039 74-00408 77-0078 83-0039 74-00408 77-0078 83-0039 74-00408 77-0078 83-0039 74-00408 77-0078 83-0039 74-00408 77-0078 83-0039 74-00408 77-0078 83-0039 74-00408 77-0078 83-0039 77-0078 74-0044 (1974-84) 77-0078 83-0039 77-0078 77-0079 81-0018 80-00438 77-00368 80-0052 81-0018 81-0	34-0001 51-0012 50-0006 80-0051B 67-0008 66-0013 82-00	
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8. DATA INVENTORY TABLE

Table 2 presents a summary listing of the data sets included in this inventory. The table lists all the data contained in the inventory sequentially by data set number. Water-property, moored current-meter, surface-drift, water-level and wave data are completely catalogued. BT data are not fully catalogued. However their existence has been noted in Table 2, and their general distribution may be deduced from the pattern of stations for a particular cruise, as they were usually collected at and along the track between stations. Over-the-side current measurements of short duration made with fixed-depth or profiling current meters have not been fully inventoried, however attempts were made to include all such data covering one tidal cycle or more.

Each column of the table contains the following information (symbols and abbreviations used in each column are explained as well):

Column 1 - Data Set I.D.

- contains the data set identifier number, which is of the form yy-nnnn, where yy are the last two digits of the year in which the data set was collected, and nnnn is the sequential number of the data set for that particular year. (The series of data set numbers applies to the whole set of inventories; gaps may appear in the sequence in any one inventory where data sets exist only in other areas or disciplines. A data set which appears in two or more areas or disciplines will have the same number in every case.) Data sets may be sub-divided by the addition of a letter at the end of the number. Sub-divisions have been used when different cruises have been grouped under one I.D. number, or when different programs were conducted on the same cruise. In the case of water-level stations, where data were collected at the same location intermittently or continuously over more than one year, one I.D. number has been used to represent the entire data set.

Column 2 - Ship or collecting agency

- contains the name of the ship (underlined), platform and/or agency.

Column 3 - Dates of measurements

- gives the dates spanning the period during which measurements were taken in the area covered by the inventory. The year is given by the first two digits of the data set number in column 1, unless the measurement period spans the end of a year, in which case it is given explicitly. Question marks mean the dates could not be confirmed, generally due to poor/lack of documentation.

Column 4 - Quantity measured

- lists the physical parameters measured in the data set. A quantity followed by a ? means that reference to such a measurement was made but no supporting details were available. Measurements identified as "Current" are Eulerian current measurements (made at a fixed location); "Current drift" refers to Lagrangian measurements. "Current profiles" are spot measurements at certain depths.

Column 5 - Instruments or methods used

- lists the instruments and methods used to make the measurements. The entries appear opposite the names of the quantities they measure. A question mark after the entry denotes an assumption, i.e. that the method used was not explicitly stated and an assumption was made from standard practice at the time. A question mark alone means that the instrument used is unknown.

Column 6 - Estimate of data precision and accuracy

- lists the estimates of the precision (repeatability) and accuracy for each instrument opposite the entry for that instrument in column 5. For instruments of a digital nature, the precision specified is based on the resolution of the instrument. Where possible, estimates made by the original investigators are used. They are entered as two numbers of the form +n, +n, where n, is the precision and n, the accuracy. Where investigator's estimates were not available, the following special symbols and entries have been used:

 $[+n_1,+n_2]$: standard oceanographic methods were used, which would normally result in these values. The techniques and precision/accuracy used in this context are:

BT	[0.2C°,0.2C°]
Reversing thermometer	[0.02c°,0.03c°]
Salinity - Hydrometer	[0.20/00,0.20/00]
Salinity - Refractometer	[0.50/00,0.50/00]
Salinity - Titration	[0.020/00,0.040/00]
Salinity - Bench salinometer	[0.01°/oo,0.02°/oo] [The make/model of salinometer is often unknown, but may be specified in Appendix 1]
High Quality	[<u>+</u> 0.005,0.010°], [<u>+</u> 0.005,0.02°/00]

 $\pm n_1$ @: manufacturer's specifications for that instrument.

CTD/STD

 $\frac{\pm n_1}{n_1}$?: an estimate has been given which is questionable for reasons detailed in Appendix 1.

The column is blank where no information was available and no reasonable assumption could be made.

Column 7 - Data rating number

- carries the data rating number assigned as explained in Section 5.

Column 8 - Area

- lists the areas in which the majority of the measurements in the data set were taken. (The areas are defined in Figure 1.)

Column 9 - Concurrent measurements

- lists known measurements in other disciplines taken as part of the data set. Further measurements may have been taken, but were not discovered while cataloguing the physical oceanographic data, and therefore cannot be listed.

Column 10 - Source or reference

- lists a primary source or reference for the data sets. Data sets held in the data banks at the Marine Environmental Data Service, Ottawa or at the National Oceanographic Data Center, Washington D.C. are identified, respectively by the entries MEDS# and NODC# followed by the data bank's identity number. A MEDS number alone does not necessarily mean that the data are not stored at NODC. If MEDS does not have the data then a NODC number is given if they are stored there.

TABLE 2: SUMMARY LISTING OF DATA SETS

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
03-0001	CHS	Jan.1,1903- Dec.31,1926	Water level	?	?	3	Chatham Sound		MEDS WL Stn# 9390
05-0002	CHS	July 30,1905 Aug.31,1906	-Water level	?	?	3	Hecate Strait, Queen Charlotte Sound		MEDS WL Stn# 8976, 9195
05-0003	снѕ	July 14,1905 Oct.2,1911	i-Water level	?	?	3	Queen Charlotte Sound		MEDS WL Stn# 8840
06-0002	CHS	May 1,1906- Present	Water level	?	? .	3	Prince Rupert		MEDS WL Stn# 9354
07-0002	CHS	Jan.1,1907- Mar.6,1908	Water level	?	?	3	Queen Charlotte Sound, Skeena River, Dixon Entrance		MEDS WL Stn# 8976,9260,9910
09-0001	CHS	June 1,1909 Aug. 26,191	− Water level 1	?	?	3	Queen Charlotte Sound, Hecate Strait, Kitimat Arm, N.Bentinck Arm, Skeena River		MEDS WL Stn# 8870, 8937 9130, 9140, 9255, 9260, 9265
10-0002	CHS	May 15- Oct 27	Water level	?	?	3	Hecate Strait	<i>:</i>	MEDS WL Stn# 9910, 9923
10-0003	CHS	Feb.9,1910- Oct.28,1913		. ?	?	3	Hecate Strait		MEDS WL Stn# 9775
11-0001	CHS	Aug.7- Sept.15, Sept.20- Oct.17	Water level	Richard	?	3	Hecate Strait, Skidegate Channel		MEDS WL Stn# 9850
11-0002	CHS	Oct.29,191 May 11,191	1- Water leve: 2	1 ?	?	3	Dean Channel		MEDS WL Stn# 8962
12-0001	CHS	May 17- Oct.31	Water leve	1 ?	?	3	Skeena River, Stewart		MEDS WL Stn# 9270,9443,9475
13-000	2 CHS	July 5- Oct•25	Water leve	1 ?	?	3	Hecate Strait, Skidegate Channel, Portland Inlet		MEDS WL Stn# 9425, 9850

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Uuknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
14-0003	CHS	May 20- Oct:31	Water level	?	?	3	Skeena River, Hecate Strait		MEDS WL Stn# 9090, 9260
15-0003	CHS	May 24- Oct-31	Water level	?	?	1	Hecate Strait, Skidegate Channel, Fitz Hugh Sound		MEDS WL Stn# 8840, 9808, 9850
16-0003	CHS	May 1- Oct.27	Water level	?	?	3	Observatory Inlet		MEDS WL Stn# 9443
22-0001	CHS	May 12,1922 Oct.5,1923	Water level	?	?	3	Queen Charlotte Sound, Dean Channel		MEDS WL Stn# 8962, 9080
23-0002	CHS	Oct.17- Dec.17	Water level	?	?	3	Hecate Strait, Skidegate Channel		MEDS WL Stn# 9850
24-0002	CHS	May 31,1924- Jan.10,1925	Water level	?	?	3	Hecate Strait, Skidegate Channel		MEDS WL Stn# 9060, 9808
28-0003	CHS	June 27- Sept.18	Water level	?	?	3	Queen Charlotte Sound		MEDS WL Stn# 8909, 9005
30-0002	CHS	June 21- Dec.31	Water level	?	?	3	Chatham Sound		MEDS WL Stn# 9309
31-0003	CHS	July 5,1931- Jan.31,1932	· Water level	?	?	3	Queen Charlotte Sound		MEDS WL Sin# 8416
34-0001	CATALYST, University of Washington	Sept.3-4	Temperature Salinity	Reversing Thermometer Titration?	[<u>+</u> .02,.03c°] [<u>+</u> .02,.04°/00]	3	Dixon Entrance		POG (1956) MEDS # 180234606
34-0002	AES Meteoro- logical Station at Cape St. James	July 27,1934 - Present	Temperature	1934-39, Thermometer 1940 - Present, Thermometer 1934-58, Titration 1959-70, Salinometer 1971 - Present, Hydrometer	?, ±.3C° ?, ±0.2° ?, ±0.06°/oo ?, ±0.02°/oo ?, ±0.3°/oo	3	Queen Charlotte Sound		Giovando (pers. comm.)

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	. Source or reference
35-0003	CHS	May 5- Sep.2	Water level	?	?	3	Queen Charlotte Sound		MEDS WL Stn# 9713
35-0004	DOT Light Station at Green Island	Feb.1,1935- Sep.14,1936	Temperature Salinity	Thermometer Titration	?, ±.3c° ?, ±0.06°/00	3	Dixon Entrance		Giovando (pers. comm.)
36-0003	POG	Sep.4-5	Temperature Salinity	Reversing Thermometer Titration	[<u>+</u> .02,.03c°] [<u>+</u> .02,.04°/oo]	3	Queen Charlotte Sound	pH, Weather	POG (1950) MEDS # 180236610
36-0004	DOT Light Station at Langara Island	Oct.22,1936- Aug.28,1937	- Temperature Salinity	Thermometer Titration	?,.3C° ?, <u>+</u> 0.06°/oo	3	Langara Island, Dixon Entrance		Giovando (pers. comm.)
37-0004	CATALYST, University of Washington	July 25-27	Temperature Salinity	Reversing Thermometer? Titration?	[<u>+</u> .02,.03c°] [<u>+</u> .02,.04°/oo]	3	Dixon Entrance	O ₂ , Wind	POG (1956) MEDS # 180237613
37-0008	DOT Light Station at Ivory Island	July 27,193 -Dec.31,195		Thermometer Titration	?, ±0.2-0.3C° ?, ±0.06°/oo	3	Queen Charlotte Sound		Giovando (pers. comm.)
37-0009	DOT Light Station at Pine Island	Jan.14,1937 - Present	Temperature Salinity	Thermometer 1937-58, Tirration 1959-69, Salinometer 1970-Present, Hydrometer	?, ±0.2-0.3C° ?, ±0.06°/oo ?, ±0.02°/oo ?, ±0.3°/oo	3	Queen Charlotte Strait	1	Giovando (pers. comm.)
38-0002	AMLAC, POG	May 24- June 6	Temperaturo Salinity	e Reversing Thermometer Titration	[<u>+</u> .02,.03c°] [<u>+</u> .02,.04°/oo]	3	Dixon Entrance Hecate Strait	, 0 ₂ , Weather	POG (1956) MEDS # 180238620 NODC # 50191
39-0001	DOT Light Station at Triple Island	Nov.1,1939 Dec.16,197		Thermometer 1939-58, Titration 1959-69, Salinometer 1970, Hydrometer	?, ±0.2-0.30° ?, ±0.06°/oo ?, ±0.02°/oo ?, ±0.3°/oo	. 3	Dixon Entrance		Giovando (pers. comm.)

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

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Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
40-0004	DOT Light Station at Langara Island	Mar.2,1940- Present	Temperature Salinity	Thermometer 1940-58, Titration 1959-69, Salinometer Sep.23,1969- Present, Hydrometer	?, ±0.20° ?, ±0.06°/oo ?, ±0.02°/oo ?, ±0.3°/oo	3	Dixon Entrance		Giovando (pers. comm.)
40-0005	DOT Light Station at Prince Rupert	Jan.2,1940- June 11,1942	Temperature Salinity	Thermometer Titration	?, +0.2c° ?, +0.06°/oo	3	Prince Rupert		Giovando (pers. comm.)
40-0006	DOT Light Station at Masset	Jan.1,1940- Oct.31,1942	Temperature Salinity	Thermometer Titration	?, +0.2c° ?, +0.06°/oo	3	Masset		Giovando (pers. comm.)
40-0007	DOT Light Station at Shannon Bay	Jan.1,1940- Aug.31,1941		Thermometer Titration	?, ±0.2c° ?, ±0.06°/oo	3	Masset Inlet		Giovando (pers. comm.)
41-0002	DOT Light Station at Port Clements	Oct.1,1941- Aug.31,1942	Temperature Salinity	Thermometer Titration	?, ±0.2C° ?, ±0.06°/oo	3	Masset Inlet		Giovando (pers. comm.)
42-0003	CHS	Sept.9-12	Water level	?	?	3	Fitz Hugh Sound		MEDS WL Stn# 8860
43-0002	снѕ	June 18-19	Water level	?	?	3	Chatham Sound (Morse Basin)		MEDS WL Stn# 9344
47-0003	CHS	May 22- Aug.22	Water level	?	?	3	Queen Charlotte Sound		MEDS WL Stn# 8810
48-0009	EHKOLI, POG	May 19- Sep.10	Temperature Salinity Drift	BT Reversing Thermometer Titration Free Current Drags	[±.2,.2C°] [±.02,.03C°] [±.02,.04°/oo] [±10 cm/s]	3	Chatham Sound, Dixon Entrance	Wind, Air Temperature, Sea State	Trites (1953, 1956)
49-0007	снѕ	July 23- Oct.6	Water level	?	?	3 .	Skeena River		MEDS WL Stn# 9275, 9285
50-0006	POG ,	Sep.16-17	Temperature Salinity	Reversing Thermometer? Titration?	[<u>+</u> .02,.03c°] [<u>+</u> .02,.04 ⁰ /00]	3	Scott Shelf	02	Scripps (1960) MEDS # 180250667 NODC # 18CE50424

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TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I•D•	Ship or collecting agency	Dates of measure—ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area		Source or reference
50-0010	CHS	July 19- Aug.15	Water level	?	?	3	Hecate Strait		MEDS WL Stn# 9242
51-0009	EHKOLI,	June 8- July 31	Temperature Salinity	BT Reversing Thermometer Titration	[±.02,.03C°] [±.02,.04°/00]	3	Seymour Inlet (south) to Portland Canal (north)	O ₂ , Secchi, Weather	IOUBC (1953) MEDS # 181351800 NODC # 18EH50435
51-0012	CEDARWOOD,	May 13-24	Temperature Salinity	Reversing Thermometer Titration	[<u>+</u> .02,.030°] [<u>+</u> .02,.04°/oo]	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance		POG (1956) MEDS # 180251660
510013	CHS	Aug.8,1951- Oct.29,1952		Lege	?	3	Gardner Canal		MEDS WL Stn# 9150
51-0015	CHS	Aug.6,1951- Aug.5,1954	· Water level	Lege	?	3	Kitimat Arm		MEDS WL Stn# 9140
51-0016	CEDARWOOD,	July 23- Aug.1	Temperature Salinity	Reversing Thermometer Titration	[±.02,.03c°] [±.02,.04°/oo	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Secchi, 02, Wind, Sea State, Humidity Atmospheric Pressure, Turbidity	POG (1956) MEDS # 180251661 NODC # 50421
51-0017	CEDARWOOD,	Aug.1	Temperature Salinity	?	?	2	Dixon Entrance		NODC # 50296
52-0013	CEDARWOOD,	July 12-27	Current Drift, Current Profile	Drift Pole Ekman Meter	<u>+</u> 10cm/s	3	Hecate Strait		Mackay (1953,1954)
53-0015A	UBC CANCOLIM II,	June 14-27	Temperature Salinity	BT Reversing Thermometer Titration	[±.2,.2c°] [±.02,.03c°] [±.02,.04°/00]	3	Queen Charlotte Sound	Secchi, O ₂ , Plankton, Benthos	IOUBC (1955a) NODC # 50521 MEDS # 181353811
53-00151	GANCOLIM II, UBC	July 16- Aug.10	Temperaturo Salinity	e BT Reversing Thermometer Titration	[±-2,.2C°] [±.02,.03C°] [±.02,.04°/oo]	3	Queen Charlott Sound, Hecate Strait, Dixon Entrance	e Secchi, Wind, O ₂ , Plankton, Benthos	TOUBC (1955a) MEDS # 181353813 NODC # 18CA50521

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

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Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
53-0016	СНЅ	Apr.28,1953 Aug.6,1954	Water level	Lege,?	7	3	Kitkatla Channel, Princess Royal Channel, Hecate Strait		MEDS WL Stn# 9053, 9115, 9242
53-0017	CHS	Apr.23- June 6	Water level	?	?	3	Masset Inlet		· MEDS WL Stn# 9927
53-0018	DOT Light Station at Sandspit	Aug.1,1953 Dec.20,1956	Temperature Salinity	Thermometer Titration	?, +0.2C° ?, +0.06°/oo	3	Hecate Strait		Giovando (pers. comm.)
54-0012A	CEDARWOOD, POG	May 6-27	Salinity Current drift, Current profiles	BT Reversing Thermometer Titration Current Drag Ekman Meter	[±.02,.03C°] [±.02,.03C°] [±.02,.04°/oo] [±10cm/s]	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Secchi, Wind, O ₂ , Sediment	POG (1955a,c) Barber and Gro11 (1955) MEDS # 180254688 NODC # 50505
54-0012в	EHKOLI,	July 1-19	Temperature Salinity Current drift, Current profile	BT Reversing Thermometer Titration Current Drag Ekman Meter	[±.2,.2C°] [±.02,.03C°] [±.02,.04°/oo] [±10cm/s]	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Secchi, 0 ₂ , Sediment	POG (1955a,c) Barber and Gro11 (1955)? MEDS # 180254689 NODC # 50515
54-0012C	CEDARWOOD,	Aug.18- Sep.7	Temperature Salinity Current drift, Current profile	BT Reversing Thermometer Titration Current Drag Ekman Meter	[±.2,.2C°] [±.02,.03C°] [±.02,.04°/oo] [±10cm/s]	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Secchi, Wind, O ₂ , Sediment	POG (1955a,c) Barber and Groll (1955) MEDS # 180254690 NODC # 50515
54-0012D	CEDARWOOD,	Nov-18- Dec-2	Temperature Salinity	BT Reversing Thermometer Titration	[+.2,.2C°] [+.02,.03C°] [+.02,.04°/oo]	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Secchi, O ₂ , Sediment	POG (1955a) MEDS # 180254691 NODC # 50515
54-0016	CHS	May 23- June 12	Water level	Lege	?	3	Necate Strait		MEDS WL Stn# 9770

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or Instru	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
54~0017	CHS	July 28- Aug.27	Water level	Foxboro	?	3	Portland Inlet		MEDS WL Stn# 9414
54-0018	DOT Light Station at McInnes Island	July 23,1954 - Present	Temperature Salinity	1954-58, Titration 1959-69, Salinometer	?, +0.2c° ?, +0.06°/oo ?, +0.02°/oo ?, +0.3°/oo	3	Queen Charlotte Sound		Giovando (pers. comm.)
55-0012	CEDARWOOD, UBC	July 10	Temperature Salinity	BT Reversing Thermometer Titration	[±.2,.2c°] [±.02,.03c°] [±.02,.04°/oo]	3	Smith Inlet	0 ₂ , Secchi	IOUBC (1955b) MEDS # 181355823 NODC # 50756
55-0013	CEDARWOOD,	May 30- June 24	Salinity Current, Current profile	BT Reversing Thermometer Titration Current Drag Ekman Meter	[±.2,.2C°] [±.02,.03C°] [±.02,.04°/oo] [±10cm/s] ?	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Weather, 0 ₂	POG (1955b) Barber (1957) MEDS # 180255699 NODC # 18CE808
55-0020	JONQUIERE, FOG	Feb.6-14	Temperature Salinity	BT Reversing Thermometer Titration	[±.2,.2c°] [±.02,.03c°] [±.02,.04°/oo]	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Weather	POG (1955b) MEDS # 180255694 NODC # 18J0808
55-0021	JONQUIERE, FOG	Apr.14-18	Temperature Salinity	BT Reversing Thermometer Titration	[+.2,.2C°] [+.02,.03C°] [+.02,.04°/oo]		Queen Charlotte Sound, Hecate Strait, Dixon Entrance	. Weather	POG (1955b) MEDS # 180255695 NODC # 18J0808
55-0022	CHS	May 11 Sep. 24	Water level	?	?	. 3	Hecate Strait, Skidegate Channel		MEDS WL Stn# 9765 9808
56-0008	GEDARWOOD, UBC	July 14-22	Temperature Salinity	Bucket Thermometer Reversing Thermometer BT Titration	? [±.02,.03C°] {±.2,.2C°] [±.02,.04°/oo]	3	Inlets adjoining Quee Charlotte Sound		IOUBC (1956a) MEDS # 181356828 NODC # 18CE906

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

				INDER S. SUMMANI	MATTER OF DATA SETS	(Courtine	u)		
Data Set I.D.	Ship or collecting agency	Dates of measure— ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
56-0009	EHKOLI, UBC	May 12-15	Temperature	BT Reversing Thermometer	[+.2,.2c°] [+.02,.03c°]	3	Queen Charlotte Strait	Secchi, 0 ₂ , PO ₄ , Plankton	IOURC (1956b) MEDS # 181356826 NODC # 50800
			Salinity	Titration	[<u>+</u> .02,.04°/00]				
56-0015	CHS	Aug.31- Sep.21	Water level	?	? · · · · ·	3	Dean Channel		MEDS WL Stu# 8970
56-0016	CHS	May 9- Sep•21	Water level	?	?	3	Hecate Strait		MEDS WL Stn# 9753
56-0017	CHS	Apr.24,1956- June 3,1957	Water level	?	?	3	Dean Channel, N.Bentinck Arm		MEDS WL Stn# 8937, 8984
57-0007A	OSHAWA, POG	Sep.27- Oct.1	Temperature	BT Reversing Thermometer	[<u>+</u> .2,.2C°] [<u>+</u> .02,.03C°]	3	Queen Charlotte Sound	Secchi, 0 ₂ , PO ₄ , Plankton	POG (1958b) MEDS # 180257712 NODC # 50764
			Salinity	Salinometer	[±.01,.02°/00]				Noso II Soro I
57-0007B	OSHAWA, POG	Dec.2-17	Temperature	BT Reversing Thermometer	[±.2,.2C°] [±.02,.03C°]	3	Queen Charlotte Sound, Dixon Entrance	Secchi, 0 ₂ Plankton	POG (1958b) MEDS # 180257716 NODC # 1808764
			Salinity	Salinometer	[<u>+</u> .01,.02 ⁰ /00]				
57-0008	OSHAWA, POG	Feb.20-21	Temperature	BT Reversing Thermometer	[±.2,.2C°] [±.02,.03C°]	3	Dixon Entrance	0 ₂ , P0 ₄ , Zooplankton	POG (1957), Dodimead (1958) MEDS # 180257705 NODC # 1808564
		•	Salinity	?	?,+.040/00				
57-0009	HORIZON, Scripps Inst.	Aug.19	Temperature	BT Reversing Thermometer	[±.2,.2C°] [±.02,.03C°]	3	Dixon Entrance	02	MEDS # 31H008020 MEDS # 31SB08020 NODC # 21SB802
	_		Salinity	Titration	[<u>+</u> .02,.04°/00				
57-0016	OSHAWA, POG	May 2-11	Temperature	BT Reversing Thermometer	[±.2,.2C°] [±.02,.03C°]	3	Approaches to Dixon Entrance and Queen	O ₂ , Weather, Plankton	POG (1958b) MEDS # 180257708 NODC # 50764
			Salinity	Titration	[<u>+</u> .02,.04 ⁰ /00]		Charlotte Sound	I	RODO II SOTOT
57-0017	CHS	June 29- Sep.13	Water level	Lege	?	3	Hecate Strait		MEDS WL Stn# 9724
57-0018	CHS	May 29,1957 Jan.2,1958	- Water level	Lege	?	3	Hecate Strait, Dixon Entrance		MEDS WL Stn# 9827, 9850, 9940
57-0019	CLIFTON,	Мау 30	Temperature Salinity	?	?	2	Queen Charlotte Strait	2	MEDS # 181357839 NODC # 18CL50097

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TABLE 2: SUMMARY LISTING OF DATA SETS (Continued) Ship or Dates of Quantity Instruments or Estimate of data Data Area Concurrent Source or Data methods used rating Set collecting measuremeasured precision and measurements reference ?=Unknown accuracy number I.D. agency ments OSHAWA, 58-0007 Mar.15-23 Temperature BT [+.2,.26°] Queen Charlotte Secchi, 02, POG (1958a) POG Reversing [+.02,.03C°] Sound, Dixon Plankton, Fish MEDS # 180258719 Thermometer Entrance NODC # 1805749 Salinity Salinometer $[+.01,.02^{\circ}/\circ\circ]$ Queen Charlotte Secchi, pH, O2, Strickland (1958) OSHAWA, June 26-Temperature BT [+.2,.2C°] 58-0008 [+.02,.03c°] Sound, Hecate SiO₃, NO₃, NO₂, MEDS # 180258723 Strait, Dixon NH₃, P, Light POG July 1 Reversing Thermometer Salinity Salinometer [+.01,.020/oo] Entrance Attenuation, Weather POG (1959a) Queen Charlotte Secchi, 02, 58-0009 WHITETHROAT. Nov.18-Temperature BT [+.2,.2C°] S103, NO3, [_.02,.03c°] Dec • 2 Reversing Sound, Hecate MEDS # 180258730 POG Thermometer Strait, Dixon Plankton, NODC # 18WH722 Salinity Salinometer $[+.01,.02^{\circ}/oo]$ Entrance Weather MEDS WL Stn# 9724, 9733 58-0012 CHS May 3-Water level Foxboro Hecate Strait Oct .15 July 26-[+.2,.2C[°]] 3 POG (1958c) 58-0014 OSHAWA, Temperature BT Approaches to Plankton, 0, POG [+.02,.03C°] Dixon Entrance MEDS # 180258725 Aug.1 Reversing and Queen NODC # 50719 Thermometer [+.01,.02°/oo] Charlotte Sound Salinity Salinometer Queen Charlotte Secchi, 02, Sound, Hecate NO3, Plankton, 59-0011A OSHAWA, June 21-30 Temperature BT [+.2,.2C°] POG (1959c) POG Reversing $[+.02,.03c^{\circ}]$ MEDS # 180259735 Thermometer Strait, Dixon Weather NODC # 180S900 Salinity Entrance Salinometer $[+.01,.02^{\circ}/\circ\circ]$ Queen Charlotte Secchi, 02, 59-0011B OSHAWA, Dec . 2-10 Temperature BT [+.2,.2C°] Herlinveaux (1959b) Herlinveaux et al. (1960) Sound, Hecate NO3, Plankton POG Reversing [+.02,.03C°] MEDS # 180259740 Strait, Dixon Thermometer [+.01,.02º/oo] Entrance Salinity Salinometer [+.2,.2C°] Queen Charlotte Secchi, 02, POG (1959b) 59-0011C OSHAWA, Apr.13-21 Temperature BT Herlinveaux (1959c) Reversing $[\pm .02, .030^{\circ}]$ Sound, Hecate NO3, Plankton POG MEDS # 180259733 Thermometer Strait, Dixon NODC # 180S787 $[+.01,.02^{\circ}/\circ\circ]$ Salinity Salinometer Entrance MEDS WL Stn# 8830, 8860, Apr.21-Queen Charlotte 59-0017 CHS Water level Lege, Sound, Fitz 8906, 9724, 9733 Sep.30 Foxboro Hugh Sound, Hecate Strait

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
59-0018	OSHAWA, POG	Jan.28-31	Temperature Salinity	BT Reversing Thermometer Salinometer	[+.2,.2C°] [+.02,.03C°] [+.01,.02°/00]	3	Dixon Entrance	0 ₂ ,Zooplankton	POG (1959d), MEDS # 180259731 NODC # 180850788
59-0019	OSHAWA,	Aug.26	Temperature Salinity	BT Reversing Thermometer Salinometer	[±.2,.2c°] [±.02,.03c°] [±.01,.02°/00]	3	Dixon Entrance	0 ₂ , Plankton, Secchi	POG (1959e)
60-0011	OSHAWA, POG	Aug.28- Sep.6	Temperature Salinity	BT Reversing Thermometer Salinometer	[+.2,.2C°] [+.02,.03C°] [+.01,.02°/oo]	3	Queen Charlotte Sound, Dixon Entrance	Secchi, 0 ₂ , Plankton	Dodimead et al. (1960) MEDS # 180260752 NODC # 1808506
60-0012	OSHAWA, POG	Oct.20-26	Temperature Salinity	BT Reversing Thermometer Salinometer	[±.2,.2C°] [±.02,.03C°] [±.01,.02°/oo]	3	Queen Charlotte Sound, Queen Charlotte Strait, Hecate Strait, Dixon Entrance, Chatham Sound, Smith Inlet	O ₂ , Weather, Plankton, Secchi	Lane et al. (1960) MEDS # 180260754 NODC # 1808510
60-0017	CHS	Apr.27,1960- Oct.5,1961	Water level	Lege, Foxboro	?	3	Queen Charlotte Sound, Belize Inlet, Hecate Strait, Seymour Inlet		MEDS WL Stn# 8458, 8464, 8470, 8476, 8482,8488, 9010, 9020, 9026, 9077, 9035, 9502
60-0018	DOT Light Station at Ronilla Island	Apr.7,1960- Present	Temperature Salinity	Thermometer 1960-69, Salinometer Jan.1,1970- Present, Hydrometer	?, +0.2C° ?, +0.02°/oo ?, +0.3°/oo	3	Hecate Strait		Giovando (pers. comm.)
61-0016	OSHAWA, POG	Apr.12-13	Temperature Salinity	BT Reversing Thermometer Salinometer	[±.2,.2C°] [±.02,.03C°] [±.01,.02°/00]	3	Queen Charlotte Sound	O ₂ , Turbidity, Weather, Plankton	Lane et al. (1961a) MEDS # 180261762 NODC # 1808621
61-0017A	WHITETHROAT,	July 27- Aug.5	Temperature Salinity	BT Reversing Thermometer Salinometer	[±·2,·2C°] [±·02,·03C°] [±·01,·02°/oo]	3	Q.C. Sound, Q.C. Strait, Hecate Strait, Dixon Entrance	Secchi, 0 ₂ , Plankton	Crean et al. (1962a) MEDS # 180261769 NOIXC # 18WH533

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency		Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area		Source or reference
61-0017B	OSHAWA, POG	Oct.4-17	•	BT Reversing Thermometer	[+.2,.2c°] [±.02,.03c°]	3	Queen Charlotte Sound, Queen Charlotte	, 2	Crean et al. (1962a) MEDS # 180261774 NODC # 50592
			Salinity	Salinometer	[<u>+</u> .01,.02°/oo]		Strait, Hecate Strait, Dixon Entrance		
61-0018	OSHAWA, POG	Feb.10-16	Temperature	BT Reversing Thermometer	[±.2,.2C°] [±.02,.03C°]	3	Queen Charlotte Sound, Hecate Strait, Dixon	Plankton	Lane et al. (1961b) MEDS # 180261759 NODC # 50532
			Salinity	Salinometer	[<u>+</u> .01,.02°/oo]		Entrance		Nobo # 50552
61-0019	OSHAWA, POG	June 3-14	Temperature	BT Reversing Thermometer	[+.2,.2C°] [+.02,.03C°]	3	Queen Charlotte Sound, Dixon Entrance	0 ₂ , Secchi, Plankton	Dodimead et al. (1961a) Dodimead et al. (1961b) MEDS # 180261765
			Salinity	Salinometer	[<u>+</u> .01,.02 ⁰ /oo]	•	Buctance		NODC # 50512
61-0020	OSHAWA, WHITETHROAT, STRANGER,	Sep.2-4	Temperature	BT Reversing Thermometer	[+.2,.2C°] [<u>+</u> .02,.03C°]	3	Dixon Entrance	02	Herlinveaux (1961) MEDS # 180961771 MEDS # 31ST06260
	HUGH M. SMITH; Operation Leapfrog; POG/		Salinity	Salinometer	[<u>+</u> .01,.02°/oo]				NODC # 31ST0626 NODC # 1899563
	Scripps/U.S. N				•				
61-0021	OSHAWA, PBS	July 3-15	Temperature Salinity	?	±0.1 ±0.02	2	Hecate Strait	Soluble Organics, O ₂ , Diatoms, Small Flagellates, Dinoflagellates	Antia et al. (1962) NODC # 180S1058
								Detritus, Chl.a N, NO ₃ , SiO ₃	•
61-0022	PBS,	Sep.15-21	Temperature	BT Reversing Thermometer	[±.2,.2C°] [±.02,.03C°]	3	Fisher Channel Cousins Inlet, Prince Rupert	, Secchi, O ₂ , Intertidal Organisms,	Waldichuk (1962a) Waldichuk & Bousfield (1962)
			Salinity Current profiles	Salinometer Ekman-Merz	[+.01],.02°/00		Harbour		, Waldichuk et al. (1968)
			Current (surface)	Drag	?			opene barphite	
61-0023	3 CHS	July 15- continuing	Water level	l Lege Foxboro	?	3	Queen Charlott Sound, Dixon Entrance	e	MEDS WL Stn# 8976, 9028, 9063, 9414

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
52-0015	OSHAWA, POG	Jan.17- Feb.5	Temperature Salinity	Reversing Thermometer BT Salinometer	[±.02,.03C°] [±.2,.2C°] [±.01,.02°/oo]	3	Queen Charlotte Sound, Queen Charlotte Strait, Hecate Strait, Dixon Entrance	Secchi, 0 ₂	Crean et al. (1962b) MEDS # 180262778 NODC # 50531
62-0016	OSHAWA, POG	June 8-23	Temperature Salinity	BT Reversing Thermometer Salinometer	[+.2,.2C°] [+.02,.03C°] [+.01,.02°/oo]	3	Queen Charlotte Sound, Dixon Entrance	Secchi, 0 ₂ , Plankton	Dodimead et al. (1962) MEDS # 180262785 NODC # 50516
62-0017	WHITETHROAT	Feb.15	Temperature Salinity	BT Reversing Thermometer Salinometer	+0.1C° [+.02,.03C°] +0.004,[.02°/oo]	3	Queen Charlotte Strait	02	Herlinveaux (1963) MEDS # 180962779 NODC # 18WH536
62-0018	OSHAWA, POG	Sep.19- Oct.10	Temperature Salinity Current drift Current profiles	BT Reversing Thermometer Salinometer Surface drift pole Ekman Meter	[±.02,.03C°] [±.01,.02°/oo] [±.01,.02°/oo] [±10cm/s]	3	Dixon Entrance, Hecate Strait	Meteorological Observations Including Wind Velocity, O ₂	Crean et al. (1963) Crean (1967) MEDS # 180262790 NODC # 1805544
62-0019	EHKOLI,	May 18-21	Temperature Salinity	Reversing Thermometer Titration	[±.02,.03C°] [±.02,.04°/oo]	3	Belize Inlet, Seymour Inlet	Secchi, 0 ₂	IOUBC (1963) NODC # 19EH50941
62-0020	EHKOLI, POG	Apr.11-26	Temperature Salinity Current Current profiles	BT Reversing Thermometer Salinometer Chesapeake Bay Institute Drag Ekman Meter	[±.2,.2C°] [±.02,.03C°] [±.01,.02°/oo] [±10cm/s]	3	Fisher Channel, Cousins Inlet, Douglas Channel, Kitimat Arm, Prince Rupert Harbour		Waldichuk et al. (1968)
62-0025	OSHAWA, POG	Mar.12- Apr.5	Temperature Salinity	BT Reversing Thermometer Salinometer	[±.2,.2C°] [±.02,.03C°] [±.01,.02°/00]	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Secchi, 0 ₂ ,	Crean et al. (1962c) MEDS # 180262781 NODC # 50500
62-0026	EHKOLI,	June 29- July 9	Temperature Salinity	Reversing Thermometer Titration	[±.02,.03C°]	3	Queen Charlotte Strait	•	IOUBC (1963) MEDS # 181362934

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency		Quantity =easured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
62-0027	CHS	Apr.24,1962 -Oct.9,1963	Water level	Lege, Foxboro	?	3	Queen Charlotte Sound, Hecate Strait, Portland Inlet		MEDS WL. Stn# 8810, 8805, 9232, 9406, 9422
63-0011A	WHITETHROAT, UBC	Мау 16-20	Temperature Salinity	Bucket Thermometer BT Reversing Thermometer Titration	+0.10° +0.010° [+.02,.04°/00]	3	Burke Channel, Dean Channel, Cascade Inlet, Roscoe Inlet	0 ₂ , Secchi	TOUBC (1964) MEDS # 181363017 NODC # 18WH955
63-0011B	WHITETHROAT, UBC	June 7–9	Temperature Salinity	Bucket Thermometer BT Reversing Thermometer Titration	+0.1c° +0.01c° [+.02,.04°/oo]	3	Rivers Inlet, Fisher Channel, Burke Channel, Dean Channel	0 ₂ , Secchi	IOUBC (1964) MEDS # 181363020 NODC # 18WH957
63-0011C	WHITETHROAT, UBC	June 27-30	Temperature Salinity	Bucket Thermometer BT Reversing Thermometer Titration	+0.10° +0.010° [+.02,.04°/00]		Gardner Canal, Douglas Channel, Porcher Island, Portland Inlet, Khutzeymateen Inlet	0 ₂ , Secchi	IOUBC (1964) MEDS # 181363023 NODC # 18WH959
63-0017	CHS	June 1,1963 -Oct.10,1964	Water level	Lege, Foxboro	?		Nass River, Observatory Inlet, Masset Inlet, Skidegate Channel		MEDS WL Stn# 9140, 9422, 9425, 9435, 9450, 9827, 9850,9910, 9920, 9963
63-0018	VELELLA, POG	Apr.18- May 27	Temperature Salinity Current	Bucket Samples BT Reversing Thermometer Titration Drogues	[+.2,.2c°] [+.02,.03c°] ?, +0.1°/00	3	Burke Channel, N.Bentinck Arm		Dodimead and Herlinveaux (1968)
64-0010	ACONA, (U.S.)	Sep.26-28	Temperature Salinity		?	2	Queen Charlotte Sound, Whale Channel, Chath Sound	⁰ 2	MEDS # 31AC17660 NODC # 31AC51766

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data	Ship or	Dates of	Quantity	Instruments or	Estimate of data	Data	Area	Concurrent	Source or
Set I.D.	collecting	measure- ments	measured	methods used ?=Unknown	precision and accuracy	rating number		measurements	reference
64-0011	WHITETHROAT,	June 4,14	Temperature Salinity	Reversing Thermometer Salinometer	[<u>+</u> .02,.03c°] +.003,[.02]°/oo	3	Dixon Entrance	O ₂ , Secchi	IOUBC (1965) NODC # 18WH50960
64-0012	EHKOLI, POG	Oct-16-28	Temperature Salinity Current Current profiles	Reversing Thermometer Salinometer Chesapeake Bay Drag Ekman Meter	[+.02,.03C ^o] [+.01,.02 ^o /oo] [+10cm/s]	3	Fisher Channel, Cousins Inlet, Douglas Channel, Kitimat Arm, Prince Rupert Harbour		Waldichuk et al. (1968)
64-0018	VELELLA,	Apr.4- June 9	Water level Current Current profiles Temperature Salinity	Foxboro Drogues Savonius-Rotor CTD "In situ" and On-board Salinometer	? <u>+</u> 0.1, <u>+</u> 0.01°/oo	3	Burke Channel, N.Bentinck Arm	Zooplankton	Dodimead and Herlinveaux (1968) MEDS WL Stn # 8873, 8928, 8935
64-0020	CHS	May 22- Sept.26	Water level	Ottboro, Foxboro	?	3	Hecate Strait, Chatham Sound, Observatory Inl	.et	MEDS WL Stn# 9306, 9333, 9425, 9450, 9940
64-0022	CHS	June 1,1964- continuing	- Water level	? .	?	3	Hecate Strait, Skidegate Channel		MEDS WL Stn# 9850
64-0023	CHS	May 1,1964- June 30,1967	Water level	?	?	3	N.Bentinck Arm		MEDS WL Stn# 8937
65-0011	ACONA, (U.S.)	Jan.10- Oct.1	Temperature Salinity	?	?	2	Whale Channel, Ogden Channel, Fitz Hugh Sound		MEDS # 31AC17640 NODC # 31AC51764
650012	ENDEAVOUR, UBC	Aug.1-15	Temperature Salinity	BT? Reversing Thermometer Salinometer	[±.2,.2C°] [±.02,.03C°] ?, ±0.02°/oo	3	Queen Charlotte Sound, Dixon Entrance	e Secchi, O ₂	IOUBC (1966) Pickard (1967) MEDS # 181365007 NODC # 18EN50972
65-0018	CHS	July 10,196 Sep.23,1966	5-Water level	?, Ottboro	?	3	Portland Inlet Observatory Inlet, Alice Arm	,	MEDS WL Stn# 9418, 9443, 9448

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Атеа	Concurrent measurements	Source or reference
65-0019	CHS	May 22- Sep.24	Water level	Ottboro (pressure)	7	3	Chatham Sound		MEDS WL Stn# 9306
65-0021	VELELLA,	Apr.19- June 7		"In-Situ" Salinometer	? ?, <u>+</u> 0.1°/oo	3	N.Bentinck Arm, Burke Channel	Zooplankton	Dodimead and Herlinveaux (1968)
66-0013	ENDEAVOUR, UBC	May 12-16	Temperature Salinity	Bucket Thermometer BT Reversing Thermometer Salinometer (Auto lab extended range model)	, +0.1c° , +0.1c° , +0.02c° ?, +0.02°/oo	3	Burke Channel, Dean Channel, Gardner Channel, Douglas Channel, Portland Inlet, Observatory Inlet, Hastings Arm	Secchi, 0 ₂ , Wind, Pressure, Sea State, Turbidity	IOUBC (1967) Pickard (1967) MEDS # 181366007 NODC # 18EN50977
66-0021	CHS	May 12- Sep.14	Water level	Ottboro	?	3	Chatham Sound		MEDS WL Stn# 9310, 9315
66-0022	CANADIAN NO.1, G.B. REED, FOG	July 7- Aug. 23	Temperature Salinity (Surface)	BT ?	[+.2,.2C°]	2	Dixon Entrance, Hecate Strait, Queen Charlotte Sound	Productivity	Dodimead (1968)
66-0023	VELELLA, (MELIBE, NOCTILUCA, INVESTIGATOR, and KNIGHT), POG	Apr.1- May 29	Temperature Salinity Current profiles Drift	CTD CTD Savonius-Rotor Drogues	?	2	Burke Channel System	Turbidity .	Herlinveaux (1973b)
670008	PARRY, FOG, CHS	July 10- Aug.7	Temperature Salinity Current(CHS	Reversing Thermometer RS5-3 RS5-3 Salinometer	[±.2,.2C°] [±.02,.03C°] ±.5,7C° ±.3,10/oo [±.01,.020/oo] [±10cm/s]	2	Prince Rupert Harbour	Secchi, 0 ₂	Waldichuk et al. (1968)
67-0009	POG KNIGHT,	Sep.27-28	Temperature Salinity	BT Reversing Thermometer RS5-3 RS5-3 Salinometer	[±.2,.2C°] [±.02,.03C°] ±.5,?C° ±.3,1°/oo [+.01,.02°/oo]	3	Kitimat Arm, Douglas Channel	Secchi, O ₂ , pH	Waldichuk et al. (1968)

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
67-0014	Eurocan Pulp & Paper Co. Ltd.	July 9-11	Temperature Salinity	?	? ?	2	Kitimat Arm	02	King and Koistinen (1967)
67-0022	ENDEAVOUR, POG	Sep.18-27	Temperature Salinity	Bisset-Berman 9006 STD	+.02,.04°° +.02,.04°/00	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Nitrates, 0 ₂ , Silicates, Phosphates	Dodimead (1985 in prep.) MEDS # 180267008 NODC # 50190
67-0023	VELELLA, INVESTIGATOR, A-P. KNIGHT, POG	Apr.1- June 8	Current Drift Current Temperature Salinity Water level	Drift Cards, Drogues Neyrpic Meter CTD CTD	?	2		Meteorological Data, Turbidity 02	Herlinveaux (1967,1973a,b)
67-0024	CHS	May 22- Aug.29	Water level	?,Ottboro,Foxboro	?	3	Dixon Entrance, Hecate Strait, Chatham Sound		MEDS WL Stn# 9060, 9325, 9342, 9344, 9343, 9360, 9391
67-0026	T.G. THOMPSON,	Feb.14	Temperature Salinity	?	?	2	Dixon Entrance	si, N ₃	NODC # 31TT51191
68-0011A	VECTOR,	May 27	Temperature Salinity	Reversing Thermometer Salinometer	[±.02,.03C°] ±.003,[.02]°/oo	3	Belize Inlet, Seymour Inlet	02	IOUBC (1969) MEDS # 181368012 NODC # 18VT50996
68-0011B	VECTOR,	July 14-17	Temperature Salinity	Reversing Thermometer Salinometer	[±.02,.030°] ±.003,[.02]°/oo	3	Belize Inlet, Seymour Inlet	Secchi, 0 ₂	IOUBC (1969) MEDS # 181368017 NODC # 18VT51001
68-0012	CEDARWOOD,	Sept. 19-20	Temperature Salinity	?	?	2	Dixon Entrance	02	NODC # 31CD51497
68-0022	POG POG	Apr.22-28	Temperature Salinity	Bissett-Berman 9006 STD	+.02,.04°° +.02,.04°/oo	3	Queen Charlotte Sound		Dodimead (1985 in prep.) MEDS # 180268006 NODC # 18EN50197
68-0024	POG	Oct.9-13	Temperature Salinity	Bissett-Berman 9006 STD	+.02,.04° +.02,.04°/00	3	Queen Charlotte Sound		Dodimead (1985 in prep.) MEDS # 180268008 NODC # 18EN50198
68-0025	SEDCO 135F Drilling Rig	Apr.22- Oct.13	Current	Hydroproducts Meter	?	2	Necate Strait	Meteorological Data	Herlinveaux (1980)

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
68-0026	SEDCO 135F Drilling Rig, DREP	June 1,1968- Apr.18,1969	- Wave Measurements	Pressure Transducer	?	3	Hecate Strait		Hafer (1970)
68-0027	CHS	May 30- Aug.26	Water level	Foxboro	?	3	Queen Charlotte Sound		MEDS WL Stn# 8981
69-0018	VECTOR,	June 1-3	Temperature Salinity	Reversing Thermometer Salinometer	[±.02,.03C°] ±.003,[.02°/oo]	3	Queen Charlotte Sound, Queen Charlotte Strait, Hecate Strait	Secchi, 0 ₂	IOUBC (1970), MEDS # 181369012 NODC # 18VT51017
69-0030	POG	Apr.27-30	Temperature Salinity	Bissett-Berman 9006 STD	+.02,.040° +.02,.04°/oo	3	Queen Charlotte Sound		Dodimead (1985, in prep.) MEDS # 180269020
69-0031	ENDEAVOUR,	Oct.1-16	Temperature Salinity	Bissett-Berman 9006 STD	+.02,.040° +.02,.040/00	3	Queen Charlotte Sound	•	Dodimead (1985, in prep.) MEDS # 180269021
69-0032	CHS	July 1-16	Water level	Foxboro (pressure)		3	Queen Charlotte Sound		MEDS WL Stn# 9060
69-0033	CHS	Aug.15- Sep.29	Water level	Foxboro (pressure) ?	3	Chatham Sound		MEDS WL Stn# 9391
69-0036	Dept. of Fisheries	March	Current	Drogues	?	2	N. Bentinck Arm	,	Kussat (1969)
70-0020	VECTOR,	May 24-26	Temperature	e BT Reversing Thermometer	[<u>+</u> .2,.2C°] [<u>+</u> .02,.03C°]		Queen Charlotte Strait	Secchi, 0 ₂	IOUBC (1971) MEDS # 181370010 NODC # 18VT51028
			Salinity	Salinometer	?, <u>+</u> 0.02°/00			•	
70-0020	UBC,	June 21-24	Temperature	e BT Reversing Thermometer	[±.2,.2C°] [±.02,.03C°]	3	Queen Charlotte Strait, Queen Charlotte	e Secchi, 0 ₂	IOUBC (1971) MEDS # 181370012 NODC # 18VT51029
			Salinity	Salinometer	?, <u>+</u> 0.02 ⁰ /oo		Sound, Hecate Strait		
70-0020	C VECTOR,	July 25-27	Temperatur	e BT Reversing Thermometer	[±.2,.2C°] [±.02,.03C°]	3	Queen Charlott Sound	e Secchi, O ₂	IOUBC (1971) MEDS # 181370014 NODC # 18VT51030
			Salinity	Salinometer	?, <u>+</u> 0.02°/oo				

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
70-0031	LAYMORE,	Mar.5-15	Temperature Salinity Temperature	9006 STD Reversing Thermometer	+.02,.04C° +.02,.04°/oo [+.02,.03C°]	3	Queen Charlotte Sound	£	Dodimead (1985 in prep.) MEDS # 180270012
			Salinity	Salinometer?	[<u>+</u> .01,.02°/00]				
70-0032	CHS	June 1-Sept.	Water level	?,Foxboro (pressure)	?	3	Chatham Sound		MEDS WL Stn# 9327, 9391
70-0033	Transport Canada Light Station at Egg Island	Mar.10,1970- Present	Temperature Salimity	Thermometer 1970-June 1971, Salinometer July 1,1970- Present, Hydrometer	?, ±0.2° ?, ±0.02°/00 ?, ±0.3°/00	3	Queen Charlotte Sound		Giovando (pers. comm.)
70-0037	Ker, Priestman, Keenan & Assoc. Ltd. for Canadian Cellulose		Current	?	?	2	Porpoise Harbour		Ker, Priestman, Keenan & Assoc. Ltd. (1970)
71-0019A	ENDEAVOUR,	Feb.11	Temperature	Reversing Thermometer	[<u>+</u> .02,.03C°]	3	Smith Inlet	Secchi, 02	IOUBC (1972) MEDS # 181371005
			Salinity	Salinometer	<u>+</u> .003,[.02]°/oo				NODC # 18EN51084
71-0019В	VECTOR,	Aug.17-18	Temperature	Reversing Thermometer	[<u>+</u> .02,.03c°]	3	Smith Inlet, Belize Inlet	Secchi, 02	IOUBC (1972) MEDS # 181371022
			Salinity	Salinometer	<u>+</u> .003,[.02]°/oo				NODC # 18VT51101?
71-0028	Canadian Cellulose Ltd.	?	Temperature Salinity	?	?	2	Porpoise Harbour, Chatham Sound	Benthos, O ₂ , pH, Turbidity	Но (1978)
71-0037	ENDEAVOUR,	Mar.5-21	Temperature Salinity	Bissett-Berman 9006 STD	±.02,.040° ±.02,.04°/00	3	Queen Charlotte Sound		Dodimead (1985 in prep.) MEDS # 180271015
71-0038	CHS	June 29- Aug.28	Water level	Foxboro	?	3	Chatham Sound		MEDS WL Stn# 9333
71-0046	EPS	July	Temperature	Reversing Thermometer	[<u>+</u> .02,.03C°]	3	N. Bentinck Arm	02	Goyette (pers. comm.)
			Salinity	Salinometer	[±.01,.020/00]				
72-0025	VECTOR,	June 22-27	Temperature Salinity	BT Reversing Thermometer Salinometer	[+.2,.2C°] [+.02,.03C°] +.003,[.02]°/oo	3	Burke Channel, Dean Channel, Roscoe Inlet, Mathieson Chann		IOURC (1973) MEDS # 181372016 NODC # 18VT1127

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency		Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area		Source or reference
72-0026	LAYMORE, Fish. & Mar. Serv.; Pac. Env. Inst.	June, July, Aug.	Salinity	Salinometer	[<u>+</u> .01,.02°/oo]	3	Kitimat Harbour, Douglas Channel	F, Cl	Harbo et al. (1974)
72-0036B	LAYMORE, Nat'l Museum, Ottawa, Dept- Fish. & Oceans	Dec.3-4	Salinity (bottom)	Salinometer	[<u>+</u> .01,.02 ⁰ /oo]	3	Cousins Inlet	Polychaetes, O ₂	Fournier and Levings (1982)
72-0037	Canadian Cellulose Ltd.	?	Temperature Salinity	?	?	2	Porpoise Harbour, Chatham Sound	O ₂ , pH, Benthos	Но (1978)
720043	?	Sep.28,1972- June 13,1973		?	?	2	Chatham Sound		MEDS (1978)
72-0044	CHS	July 7- Sep.27	Water level	?, Foxboro (pressure)	?	3	Chatham Sound, Masset Inlet		MEDS WL Stn# 9312, 9910 9940
73-0024	LAYMORE, Fish. & Mar. Serv.; Pac. Env. Inst.	June	Salinity (Interstitia only?)	Salinometer il	[<u>+</u> .01,.02 ⁰ /oo]	3	Kitimat Harbour	F, C1	Harbo et al. (1974)
73-0029	LAYMORE, Museum Nat'1 Sci., Ottawa	Apr.2	Temperature (surface)	Thermometer	7	2	Swanson Bay	Sediment, 0 ₂ , Polychaetes	Fournier and Levings (1982)
73-0031	A Pollution Control Branch, Victoria	Apr.9-11	Temperature Salinity Water level	Beckman RS5	+0.05,0.50° +0.005,0.3°/oo	3	Prince Rupert, Chatham Sound	O ₂ , pH, NO ₃ , PO ₄ , NH ₃ , TOC, HEC, TR, Turbidity	Drinnan and Webster (1974)
73-0031	B Pollution Control Branch, Victoria	July 10-12	Temperature Salinity Water level	Beckman RS5	+0.05,0.50° +0.005,0.3°/oo	3	Prince Rupert, Chatham Sound	O ₂ , pH, NO ₃ , PO ₄ , NH ₃ , TOC, HEC, Turbidity	Drinnan and Webster (1974)
73-0031	C Pollution Control Branch, Victoria	Oct • 24-25	Temperature Salinity Water level	Beckman RS5 Beckman RS5 Reckman RS5	+0.05,0.50° +0.005,0.3°/oo	3	Prince Rupert, Chatham Sound	o ₂ , pH, No ₃ , PO ₄ , TOC, HEC Turbidity	Drinnan and Webster (1974)
730032	. Canadian Cellulose Ltd	?	Temperature Salinity	e ?	i	2	Porpoise Harbour, Chatham Sound	O ₂ , pH, Turbidity, Benthos	но (1978)

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

			•	ADDO L. BOURIERI DI	TIME OF BUILDING	(continue	-,		
Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
73-0040	CHS	Feb.1- Dec.31	Water level	Hagenuk (pressure)	?	3	Dixon Entrance		MEDS WL Stn# 9964
73-0041	CHS	Aug.17,1973- June 25,1974	Water level	Ottboro, Foxboro	?	3	Skeena River		MEDS WL Stn# 9260
73-0042	CHS	Aug.17- Sep.19	Water level	Foxboro (pressure)	?	3	Chatham Sound		MEDS WL Stn# 9250
73-0047	Slaney & Co. Ltd.	March	Temperature Salinity	Hydrolab CT Meter	?	2	Prince Rupert		Slaney & Co. Ltd. (1973) (McDonald, pers. comm.)
73-0048	Dept. Fish. & Oceans	Summer	Current?	Drogues?	?	2	N. Bentinck Arm		Schouwenburg (pers. comm.)
73-0049	Dept. Fish. & Oceans	Oct.26	Temperature Salinity	?.	?	2	N. Bentinck Arm	Biological	Levings (pers. comm.)
74-0040A	Env. Prot. Serv. (EPS), Mar. Studies Group	July 9	Temperature Salinity	Thermometer Refractometer	? [<u>+</u> .5,.5°/00]	3	Porpoise Harbour	0 ₂ , Taxonomy (Intertidal flora & fauna)	Packman (1977)
74-0040B	EPS, Marine Studies Group	Aug • 6-9	Temperature Salinity	Thermometer Refractometer	? [<u>+</u> .5,.5°/oo]	3	Porpoise Harbour	0 ₂ , Taxonomy (intertidal flora & fauna)	Packman (1977)
74-0041	LAYMORE, Fish. & Oceans, Museum Nat'l Sci., Ottawa	Aug.1	Temperature Salinity (bottom)	Rev.Thermometer Salinometer	[+.02,.03C°] [+.01,.02°/oo]	2	Cousins Inlet	O ₂ , Sediment, Biota	Fournier & Levings (1982)
74-0042	Seatech II, Dobrocky for AMAX	June 20-30	Temperature Salinity	Reversing Thermometer ?	[<u>+</u> .02,.03c°]	2	Alice Arm, Hastings Arm	Sediment, Biota, Metals, O ₂	Littlepage (1974, 1978) Krauel (1981)
74-0043	Dobrocky Seatech Ltd. for Northcoast Environmental Analysis Team	Oct.20- Nov.8	Temperature Salinity Current	Hydrolab Surveyor Model 6D Helle 4100	[+?,.2C°] [+?,.15°/oo] ?	3	Prince Rupert Harbour, Chatham Sound	O ₂ , Trans- missivity, pH, Plankton, Benthos, Sediment	NEAT (1975)
74-0044	Canadian Cellulose Ltd.	Feb present	Temperature	Thermometer	[±.02,.03C°]	2	Porpoise Harbour,	O ₂ , pH, Benthos,	Но (1978)
			Salinity	Titration	[<u>+</u> .02,.04°/oo]		Chatham Sound	Turbidity	•
74-0049	CHS	June 5-25	Water level	Foxboro (pressure)	?	3	Skeena River		MEDS WL Stn# 9266

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
74-0050A	EPS	June 11	Temperature	Reversing Thermometer	[<u>+</u> .02,.03C°]	3	Cousins Inlet	O ₂ , Sediment, Benthos	Packman et al. (1975)
			Salinity	Salinometer	[<u>+</u> .01,.02 ⁰ /00]			benthos	
74-0050B	EPS	Sept. 4	Temperature	Reversing Thermometer	[<u>+</u> .02,.03C°]	3	Cousins Inlet	O ₂ , Sediment, Benthos	Packman et al. (1975)
			Salinity	Salinometer	[<u>+</u> .01,.02°/00]				
75-0061	EPS, Vancouver	June 24-25	Temperature	Reversing Thermometer	[<u>+</u> .02,.03C°]	3	Kitimat Arm	O ₂ , Trace Metals,	Packman and Bradshaw (1977)
			Salinity	Salinometer	[<u>+</u> .01,.02 ⁰ /00]			Benthos, Sediment	
75-0063	LAYMORE, Museum Nat'1	Nov.19	Temperature	Reversing Thermometer	[<u>+</u> .02,.03C°]	3	Cousins Inlet, Swanson Bay,	0 ₂ , Sediment, Polychaetes	Fournier and Levings (1982)
	Sci., Ottawa		Salinity (bottom)	Salinometer	[<u>+</u> .01,.02°/oo]		Coolidge Point, Ocean Falls Harbour		
75-0064	Dobrocky Seatech Ltd. for AMAX	July 18	Temperature Salinity	Bottle casts	?	2	Alice Arm	O ₂ ,pH,Chl. a, Metal,Biota, Sediment	Littlepage (1978) Krauel (1981)
750069	G.B. REED, PBS	Apr.8-24 July 8-24 Oct.7-24	Temperature (bottom)	BT	[<u>+</u> .2,.2G°]	2	Hecate Strait	Groundfish	
75-0070	CHS	Mar.1,1975- Dec.31,1979		?	?	3	Dixon Entrance		MEDS WL Stn# 9964
76-0050	Dobrocky Seatech Ltd.	Aug. 17-18	Temperature	Reversing Thermometer	[<u>+</u> .02,.03C°]	3	Alice Arm	0 ₂ , Biota, Sediment	Littlepage (1978) Krauel (1981)
	for Dr. J. Littlepage		Salinity Current	Salinometer Aanderaa RCM-4	[±.01,.02°/oo] ±1 cm/s, ±5°@		•		, ,
76-0056	?	Apr.19- July 23	Waves	?	?	2	Prince Rupert		MEDS (1978)
76-0062	Dobrocky Seatech for Dr. J.	Sept 21-23	Current Temperatur	Aanderaa RCM-4 e Reversing Thermometer	+1 cm/s, +5°@ [+.02,.03C°]	3	Alice Arm	o ₂	Webster (1977b)
	Littlepage		Salinity	Salinometer	[<u>+</u> .01,.02°/oo]				

measured methods used precision and rating Set collecting measuremeasurements reference ?=Unknown accuracy number I.D. ments agency +1 cm/s, +5°@ 76-0063 Dobrocky Dec.9-10 Current Aanderaa RCM-4 Alice Arm 02 Webster (1977b) T+.02,.03C°1 Seatech Temperature Reversing for Dr. J. Thermometer Littlepage Salinity Salinometer $[+.01,.02^{\circ}/oo]$ Wind, 02, 77-0042A SEALION. July 8-Temperature Aanderaa +0.02,0.01-0.03C Kitimat Arm Webster (1977a) Sep.27 Thermistor Chain Barometric Webster (1980a) Dobrocky +0.02,0.02C° Seatech Ltd. Temperature Reversing Pressure, Sea Webster and Ford (1980) Thermometer State Guildline 8705 +0.0005,0.01C° Temperature +0.001,0.02°/oo Salinity CTD Salinity Salinometer ?, +0.02°/oo

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Estimate of data

?, +1cm/s (speed),

+0.02,0.01-0.03C°

+0.02,0.02C°

+0.35,7.5° (direction)

+0.0005,0.01C°

+0.001,0.02°/00 ?, +0.02°/00

?, ± 1 cm/s (speed),

+0.006,0.03 dbar

+0.02,0.01-0.03C°

+0.02,0.02C°

+0.35,7.5° (direction) +0.006,0.03 dbar

+0.0005,0.01C°

 $\frac{+0.001,0.02^{\circ}/\circ\circ}{?, +0.02^{\circ}/\circ\circ}$

?, +1cm/s (speed),

+0.35,7.5° (direction) +0.006,0.03 dbar

Data

Area

Kitimat Arm

Kitimat Arm

Concurrent

Wind, O2,

Wind, O2,

State

Barometric

Pressure, Sea

State

Barometric

Pressure, Sea

Source or

Webster (1977a)

Webster (1980a)

Webster (1977a) Webster (1980a)

Webster and Ford (1980)

Webster and Ford (1980)

Instruments or

Aanderaa RCM-4

Thermistor Chain

Reversing

Thermometer

Salinometer

Guildline 8705

Aanderaa RCM-4

Thermistor Chain

Reversing

CTD

Water level Aanderaa TG3-A

Thermometer

Salinometer

Guildline 8705

Aanderaa RCM-4

Water level Aanderaa TG3-A

CTD

Water level Aanderaa TG3-A

Temperature Aanderaa

Quantity

Current

Temperature

Temperature

Salinity

Salinity

Current

Dec.5,1977- Temperature Aanderaa

Temperature

Temperature Salinity

Salinity

Current

Dates of

Sep.25-

Mar.6,1978

Dec.12

Ship or

Data

77-0042B SEALION,

77-0042C SEALION.

Dobrocky

Dobrocky

Seatech Ltd.

Seatech Ltd.

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure— ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
77-0042D	SEALION, Dobrocky Seatech Ltd.	Mar.7-13, 1978; May 9-10, 1978(CTD)	Temperature Temperature Temperature Salinity Salinity Current Water level	Aanderaa Thermistor Chain Reversing Thermometer Guildline 8705 CTD Salinometer Aanderaa RCM-4	+0.02,0.01-0.03C° +0.02,0.02C° +0.0005,0.01C° +0.001,0.02°/oo 7, +0.02°/oo 2, +1cm/s (speed), +0.35,7.5° (direction) +0.006,0.03 dbar	. 3	Kitimat Arm	Wind, 0 ₂ , Barometric Pressure, Sea State	Webster (1977a) Webster (1980a) Webster and Ford (1980)
77 - 0042E	SEALION, Dobrocky Seatech Ltd.	June 8-13, 1978	Temperature Temperature Salinity Salinity	Thermometer	+0.02,0.02C° +0.0005,0.01C° +0.001,0.02°/oo 7, +0.02°/oo	3	Kitimat Árm	Wind, O ₂ , Barometric Pressure, Sea State	Webster (1977a) Webster (1980a) Webster and Ford (1980)
77-0043	PARIZEAU,	Feb.4-16	Temperature Salinity	Reversing Thermometer BT Salinometer	<0.01, <u>+</u> 0.02C° [+.2, .2C°] <u>+</u> 0.003,0.02°/oo	3	Kitimat Arm, Porpoise Harbour	Benthos, 0 ₂ , Petroleum Residue, NO ₃ , Mussels, SiO ₃ , Plankton, PO ₄	Macdonald et al. (1978) Macdonald et al. (1983) Bornhold (1983)
77 – 0057A	PARIZEAU, IOS	May 17-22	Temperature Salinity Current Water level	8700 CTD Reversing Thermometer Guildline 8100, 8700 CTD Salinometer Aanderaa RCM-4	?, ±0.03c° [±.02, .03c°] ?, ±0.05°/oo [±.01, .02°/oo] ±1 cm/s,5° @	3	Queen Charlotte Sound	e O ₂ , NO ₃ , PO ₄ , SiO ₃ , Bottom Sediments	Huggett et al. (1981) Thomson et al. (1981a) Thomson et al. (1981b) Thomson et al. (1980a) Thomson et al. (1980b) Thomson et al. (1980c) Thomson et al. (1980d)
77-00571	B ENDEAVOUR,	July 14-22	Salinity Current	e Guildline 8100, 8700 CTD Reversing Thermometer Guildline 8100, 8700 CTD Salinometer Aanderaa RCM-4	?, ±0.03C° [±.02,.03C°] ?, ±0.05°/oo [±.01,.02°/oo] ±1 cm/s,5° @	3	Queen Charlott Sound, Laredo Sound, Princip Channel, Caamano Channe	e	Huggett et al. (1981) Thomson et al. (1981a) Thomson et al. (1981b) Thomson et al. (1980a) Thomson et al. (1980b) Thomson et al. (1980c) Thomson et al. (1980d)

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
77-0057C	PARIZEAU, TOS	Sep.20-27	Temperature	Guildline 8100, 8700 CTD Reversing Thermometer Guildline 8100,	?, ±0.03c° [±.02,.03c°] ?, +0.05°/00	3	Queen Charlotte Sound, Laredo Sound, Principe Channel	o ₂ , No ₃ , Po ₄ , Sio ₃	Huggett et al. (1981) Thomson et al. (1981a) Thomson et al. (1981b) Thomson et al. (1980a)
			Salinity	8700 CTD Salinometer	[±.01,.02°/00]				Thomson et al. (1980b) Thomson et al. (1980c) Thomson et al. (1980d)
77-0058	EPS	June	Temperature	Reversing Thermometer	[<u>+</u> .02,.03C°]	3	Porpoise Harbour	02	Packman (1979a)
			Salinity	Salinometer	[<u>+</u> .01,.02 ⁰ /00]				
77-0059	EPS	June 13	Temperature	Reversing Thermometer	[<u>+</u> .02,.03C°]	· 3	Hastings Arm, Alice Arm		Goyette (pers. comm.)
			Salinity	Salinometer	[<u>+</u> .01,.02°/00]				
77-0064	?	Mar.10,1977? -Feb.27,1978		?	?	2	Kincolith		MEDS (1978)
77-0065	?	July 10,1977 -Mar.22,1978		? .	?	2	Kitimat		MEDS (1978)
77-0066A	G.B. REED,	July 13-19	Temperature	XBT	?, <u>+</u> 0.10°		Queen Charlotte Sound	Shrimp	Ballantyne (1978a) Dodimead, Ballantyne and Douglas (1979a)
77-0066в	G.B. REED, PBS	Aug.24- Sep.8	Temperature	XBT BT	?, <u>+</u> 0.1c°		Queen Charlotte Sound	Groundfish	Ballantyne (1978a) Dodimead, Ballantyne and Douglas (1979a)
77-0067	снѕ	Apr.25,1977- July 31,1978 Aug.19- Oct.31,1978	- Water level 3;	HWK float	?	3	Kitimat Arm		MEDS WL Stn# 9140
77-0068	CHS	June 21- Aug.30	Water level	Ottboro (pressure)	?	3	Hecate Strait		MEDS WL Stu# 9105
77-0076	Dobrocky Seatech Ltd.	Mar.10-11	Temperature	Reversing Thermometer	[<u>+</u> .02,.03C°]	3	Alice Arm	02	Webster (1977b)
	for Dr. J. Littlepage		Salinity Current	Salinometer Aanderaa	[±.01,.02°/oo] ±1 cm/s, ±5°@				

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
77-0077	Dobrocky Seatech Ltd. for Dr. J. Littlepage	June 15-17	Temperature Salinity Current	Reversing Thermometer Salinometer Aanderaa	[±.02,.03C°] [±.01,.02°/oo] ±1 cm/s,±5°@	3	Alice Arm	02	Webster (1977b)
77-0078	Dobrocky Seatech Ltd. for Dr. J. Littlepage	Sept. 19-20	Temperature Salinity	Reversing Thermometer Salinometer	[±.02,.03C°] [±.01,.02°/00]	3	Alice Arm	02	Webster (1977b)
77-0079	Assoc. Eng. Services	July 4-15	Temperature Salinity Current Drift	Aanderaa RCM-4 Aanderaa RCM-4 Drogues	+?,0.02C° +?,0.1°/oo accuracy +1 cm/s or 2% of speed, +0.4°direction accuracy +5 cm/s	3	Prince Rupert	Bottom Grab Samples	Assoc. Eng. Serv. (1977)
77-0080	Canadian Cellulose	?	Current	?	?	2	Porpoise Harbou	r	Simons (1977)
78-0028A	UBC TOFI	NO,Mar.13-20	Salinity	Salinometer- Guildline 8400	<u>+</u> 0.003°/ao, ?	3	Dixon Entrance, Chatham Sound	Plankton	Dilke et al. (1979)
78-0028B	IMPERIAL TOFI	NO, July 24- Aug.3	Salinity	Salinometer- Guildline 8400	<u>+0</u> .003°/oo, ?	3	Hecate Strait, inlets	Plankton	Dilke et al. (1979)
78-00280	UBC TMPERIAL TOFI	<u>NO</u> ,Aug.12-27	Temperature (surface) Salinity (surface)	Engine Intake Thermometer Salinometer- Guildline 8400	? <u>+</u> 0.003°/oo, ?	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Chl.a, Plankton	Dilke et al. (1979)
78-00281	UBC	NO, Sep.11-27	Temperature (surface) Salinity (surface)	Engine Intake Thermometer Salinometer- Guildline 8400	? <u>+</u> 0.003°/oa, ?	3	Queen Charlotte Sound, Hecate Strait	PO ₄ , NO ₂ , Plankton	Dilke et al. (1979)
78-0028	UBC UBC	INO,Oct.18-26	Temperature (surface) Salinity (surface)	Engine Intake Thermometer Salinometer- Guildline 8400	? +0.003°/oo, ?	3	Queen Charlott Sound, Hecate Strait, Dixon Entrance	e Chl.a, PO ₄ , NO ₂ , Plankton	Dilke et al. (1979)
78-0028	F IMPERIAL TOF URC	<u>INO</u> ,Jan.2-7, 1979	Temperature (surface) Salinity (surface)	Engine Intake Thermometer Salinometer- Guildline 8400	? +0.003°/oo, ?	3	Queen Charlott Sound, Hecate Strait	e Chl.a, PO ₄ , NO ₂ , Plankton	Dilke et al. (1979)

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

				INDE 21 DOMESTIC DE	DIAMO OF DATA DELD	(00112111001	.,		
Data Set I.D.	Ship or collecting agency	Dates of measure— ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
78-0028G	IMPERIAL TOFING	,Mar.30,1979- Apr.8,1979	Temperature Salinity (surface)	Bucket Thermometer XBT Salinometer- Guildline 8400	,? [±.2,.2C°] +0.003°/oo,?	3	Queen Charlotte Sound, Hecate Strait	Chl.a, PO ₄ , NO ₂ , Plankton	Dilke et al. (1979)
78-0029A	SEALION, Seakem for IOS	June 21-27	Temperature Salinity	AMS CTD-12	+.02,.2C° +.02,.2°/oo	3	Kitimat, Douglas Channel	Plankton, 0 ₂ , PO ₄ , SiO ₃ , NO ₃ , Sediment, Biota, Hydrocarbons	Erickson et al. (1979) Erickson (1979)
78 - 0029B	SEALION, Seakem for IOS	Oct •20-25	Temperature Salinity	Reversing Thermometer Salinometer	<u>+</u> .01,.02C° <u>+</u> .003,.02°/oo	3	Kitimat, Douglas Channel	Plankton, 0 ₂ , PO ₄ , SiO ₃ , NO ₃ , Sediment, Biota, Hydrocarbons	Erickson et al. (1979) Erickson (1979)
78-0029C	SEALION, Seakem for IOS	Feb.8-13, 1979	Temperature Salinity	Reversing Thermometer Salinometer	±.01,.020° ±.003,.02°/00	3	Kitimat, Douglas Channel	Plankton, 0 ₂ , PO ₄ , SiO ₃ , NO ₃ , Sediment, Biota, Hydrocarbons	Erickson et al. (1979) Erickson (1979)
78-0037	EPS	July 13	Temperature Salinity	Reversing Thermometer Salinometer	[<u>+</u> .02,.03c°] [<u>+</u> .01,.02°/00]	° 3	Porpoise Harbour, Wainwright Basin	02	Packman (1979a)
78-0047	ARCTIC HARVESTER, PBS	Jan.25- Feb.2	Temperature	XBT	?, <u>+</u> 0.1c°	3	Queen Charlotte Sound	Fish Stocks	Dodimead, Ballantyne and Douglas (1979b)
78-0048	G.B. REED PBS	Jan.26-30	Temperature	XBT	?, <u>+</u> 0.10°	3	Queen Charlotte Sound	Fish Stocks	Dodimead, Ballantyne and Douglas (1979b)
78-0049	ARCTIC HARVESTER, PBS	Mar.15-27	Temperature Salinity	XBT, Reversing Thermometer Salinometer	?, ±0.1C° [±.02,.03C°] [±.01,.02°/oo]	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Pollock Survey	Dodimead, Ballantyne and Douglas (1979b)
78-0050	ARCTIC HARVESTER, PBS	May 25-30	Temperature	XBT, BT	?, <u>+</u> 0.10°	3	Queen Charlotte Sound	Rockfish Survey	Dodimead, Ballantyne and Douglas (1979b)
78-0051	ARCTIC HARVESTER, PBS	July 9-10	Temperature	BT Reversing Thermometer	[±.2,.2C°] [±.02,03C°]	3	Queen Charlotte Sound	Groundfish	Dodimend, Ballantyne and Douglas (1979b)
78-0052	G.B. REED, M.V. NEMESIS, PBS	July 5-25	Temperature	ХВТ	?, <u>+</u> 0.1C°	3	Queen Charlotte Sound, Hecate Strait, Dixon	Pollock	Dodimend, Ballantyne and Douglas (1979b)

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TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Uuknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
78-0053	G.B. REED,	July 29- Aug.1	Temperature	XBT, BT Reversing Thermometer	?, ±0.1c° [±.2,.2c°] [±.02,.03c°]	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Dover Sole	Dodimead, Ballantyne and Douglas (1979b)
			Salinity	Salinometer	[<u>+</u> .01,.02°/oo]				•
78-0054	G.B. REED, PBS	Aug.30- Sep.18	Temperature	XBT BT Reversing Thermometer	?, ±0.1C° [±.2,.2C°] [±.02,.03C°]	3	Queen Charlotte Sound, Hecate Strait	Groundfish	Dodimead, Ballantyne and Douglas (1979b)
			Salinity	Salinometer	[<u>+</u> .01,.02°/00]				
78-0055	ARCTIC HARVESTER, PBS	Sep.22-24	Temperature	XBT	?, <u>+</u> 0.10°	3	Queen Charlotte Sound, Hecate Strait	Pollock	Dodimead, Ballantyne and Douglas (1979b)
78-0056	G.B. REED, M.V. BLUE WATERS, PBS	Oct.4-21	Temperature	XBT	?, <u>+</u> 0.10°	3	Queen Charlotte Sound	Rockfish	Dodimead, Ballantyne and Douglas (1979b)
	rbs								
780057	CHS	July 19- Aug.26	Water level	Ottboro (pressure)	?	3	Masset Inlet		MEDS WL Stn# 9920, 9930
79-0036A	IMPERIAL TOFIN Ship-of- Opportunity Programme	0 May 8-17	Temperature	XBT, Modified Bucket Thermometer(sf), Engine Intake Thermometer	<u>+</u> 0.10°	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Plankton, SiO ₃ Chl.a, NO ₃ , NO PO ₄	, Perry et al. (1981) 2'
			Salinity (3 m)	Salinometer- Guildline 8400	+0.003°/oo, ?				
7900361	3 IMPERIAL TOFIN Ship-of- Opportunity Programme	0 June 19- July 1	Temperature	XBT, Modified Bucket Thermometer(sf), Engine Intake Thermometer	<u>+</u> 0.10°	3	Queen Charlott Sound, Hecate Strait, Dixon Entrance	e Plankton, SiO. Chl.a, NO ₃ , NO PO ₄	, Perry et al. (1981) 2,
			Salinity (3 m)	Salinometer- Guildline 8400	±0.003°/00, ?				
79-0036	C IMPERIAL TOFI Ship-of- Opportunity Programme	NO July 13-29	Temperatur	E XBT, Modified Bucket Thermometer(sf), Engine Intake Thermometer	<u>+</u> 0.1c°	` 3	Queen Charlott Sound, Hecate Strait, Dixon Entrance	e Plankton, SiO Chl.a, NO ₃ , N PO ₄	3, Perry et al. (1981) 0 ₂ ,
			Salinity (3 m)	Salinometer- Guildline 8400	+0.003°/oo, ?				·

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of precision accuracy	and rat	ita Ing iber	Area	Concurrent measurements	Source or reference
79-0036D	IMPERIAL TOFINO Ship-of- Opportunity Programme	Jan.30- Feb.9,1980	Temperature (surface)	Modified Bucket Thermometer (sf), Engine Intake	2	3	3		Plankton, SiO ₃ , Chl.a, NO ₃ , NO ₂ , PO ₄	Perry et al. (1981)
			Salinity (3 m)	Salinometer- Guildline 8400	<u>+</u> 0.003°/00,	?				
79-0036E	IMPERIAL TOFINO Ship-of- Opportunity Programme	Apr.10-17, 1980	Temperature (surface)	Modified Bucket Thermometer (sf), Engine Intake	<u>+</u> 0.10°	. 3	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Plankton, SiO ₃ , Chl.a, NO ₃ , NO ₂ , PO ₄	Perry et al. (1981)
	110613		Salinity (3 m)	Salinometer- Guildline 8400	<u>+</u> 0.003°/00,	?				
79-0036F	IMPERIAL TOFINO Ship-of- Opportunity Programme	May 30- June 7,1980	Temperature	XBT, Modified Bucket Thermometer(sf), Engine Intake Thermometer	<u>+</u> 0.1c°	:	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Plankton, SiO ₃ , Chl.a, NO ₃ , NO ₂ , PO ₄	Perry et al. (1981)
			Salinity (3 m)	Salinometer- Guildline 8400	<u>+</u> 0.003°/00,	?				
79-0036G	IMPERIAL TOFINO Ship-of- Opportunity Programme	Aug.,1980	Temperature Salinity	XBT, Modified Bucket Thermometer(sf), Engine Intake Thermometer Salinometer-	<u>+0.10°</u>		3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Plankton, SiO ₃ , Chl.a, NO ₃ , NO ₂ PO ₄	Perry et al. (1981)
			(3 m)	Guildline 8400	<u>+</u> 0.003°/00,	?				_
79-0051	EPS	June 3-10	Temperature Salinity	Plessey 9400 CTD	? ?		2	Porpoise Harbour, Tuck Inlet, Prince Rupert Harbour	O ₂ , Sediment, Biota	Packman (1979a,b) Pomeroy (1983)
79-0052	ARCTIC HARVESTER, PBS	Jan•27– Feb•6	Temperature	ХВТ	?, <u>+</u> 0.10°		3	Hecate Strait, Dixon Entrance		Dodimead and Ballantyne (1980)
79-0053	M.V. SCOTIA BAY	Mar.13-29	Temperature	XBT ·	?, <u>+</u> 0.10°		3	Necate Strait	Pollock	Dodimead and Ballantyne (1980)
79 - 0056A	G.B. REED, PBS and Geol. Survey of	June 27- July 12	Temperature	XBT, Reversing Thermometer	?, +0.10° [<u>+</u> .02,.030°		3	Queen Charlotte Sound, Hecate Strait	Groundfish, Sediment	Dodimead and Ballantyne (1980)
	Canada		Salinity	Salinometer	[<u>+</u> .01,.020/	00]				

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area		Source or reference
79-0056В	G.B. REED, PBS and Geol. Survey of Canada	Sep.7-20	•	XBT, Reversing Thermometer Salinometer	?, +0.1c° [+.02,.03c°] [+.01,.02°/oo]	3	Queen Charlotte Sound, Hecate Strait	Groundfish, Sediment	Dodimead and Ballantyne (1980)
79-0059	G.B. REED,	May 14-16	Temperature	XBT	?, <u>+</u> 0.1c°	3	Queen Charlotte Sound	Shrimp .	Dodimead and Ballantyne (1980)
79-0060	CHS	June 16- Aug.21	Water level	Ottboro (pressure)	?	3	Queen Charlotte Sound, Masset Inlet		MEDS WL Stn# 9056, 9063, 9067, 9823, 9920
79-0065	OCEAN KING, Tides and Currents, IOS	Apr.4- Dec.3	Water level	?	?	3	Cape St. James (Hecate Strait)		MEDS WL Stn # 9710
79-0066	PANDORA, Tides and Gurrents, IOS	August	Temperature Salinity Current profiles	InterOcean CTD Marsh-McBirney	?	2 .	Mouth of Skeena River	ı	A. Ages (pers.comm.)
80-0042A	Department of Fisheries and Oceans, Beak Consultants Lt	Apr.22- June 29	Temperature Salinity Current Drift	Applied Microsystems CTD Endeco 110 Drogues	?, ±0.02C° ?, ±0.03°/oo ±0.07cm/s, ±10°		Masset Inlet, Yakoun River and Estuary	Plankton, Fish, NO ₃ , NO ₂ , NH ₃ , Chl.a, O ₂ , Sediment	
80-0043A	VECTOR,	May 22-26	Temperature Salinity	Reversing Thermometer Salinometer	[+.02,.03C°] [+.01,.02°/oo]	3	Alice Arm	Sediment,Biota	Krauel (1981) Goyette (pers. comm.)
80-0043E	VECTOR, EPS	Oct. 8-13	Temperature Salinity	Reversing Thermometer Salinometer	[±.02,.03C°] [±.01,.02°/oo]	3	Alice Arm	Biota	Krauel (1981) Goyette (pers. comm.)
80-0051	A G.B. REED,	Jan•15-22	Temperature	Reversing Thermometer Bissett-Berman S		3	Queen Charlott Sound, Hecate Strait, Dixon Entrance	e Ichthyoplankto	n Mason et al. (1981)
			Salinity	Bissett-Berman S Salinometer	[±.01,.02°/oo]				
80-0051	B G.B. REED, PBS	Feb.13-20	Temperature	Reversing Thermometer Bissett-Berman S	?, ±0.1C° [±.02,.03C°] TD ?	3	Queen Charlot Sound, Hecate Strait, Dixon Entrance		on Masoπ et al. (1981)
			Salinity	Bissett-Berman S Salinometer					

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

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Data Set I.D.		Dates of measure- ments	Quantity measured	Instruments or methods used ?≃Unknown		Data rating number	Area	Concurrent measurements	Source or reference
80-0051C	G.B. REED, PBS	Mar.12-20	Temperature Salinity	XBT Reversing Thermometer Bissett-Berman STD Bissett-Berman STD Salinometer		3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Ichthyoplankton	Mason et al. (1981)
80-0051D	G.B. REED, PBS	Apr.15-23	Temperature Salinity	XBT Reversing Thermometer Bissett-Berman STD Bissett-Berman STD	?, ±0.1C° [±.02,.03C°] ?	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance	Ichthyoplankton	Mason et al. (1981)
80-0052	EPS	Aug.20-21	Temperature Salinity	Salinometer Plessey 9400 CTD	[±.01,.02°/oo] ? ?	2	Porpoise Channel and Harbour, Wainwright Basin	02	Pomeroy (1983)
80-0053	CHS	Apr.28- Sept.8	Water level	Ottboro (pressure)	?	3	Dixon Entrance, Masset Inlet		MEDS WL# 9910, 9920, 9940, 9950
80-0055в	G.B. REED, PBS	May 7-21	Temperature	XBT	?, <u>+</u> 0.10°	2	Queen Charlotte Sound	Fisheries Research	Dodimead and Ballantyne (1984)
81-0018	PARIZEAU, 10S (Coastal Zone Cruise 2)	Dec.3-7	Temperature Salinity Currents Water level	CTD Aanderaa, Neil Brown	+.003, .01c° +.005, .01°/oo +1cm/s or 2% speed @ ? ?	3	Alice Arm, Observatory Inlet	0 ₂ , PO ₄ , SiO ₃ , NO ₃	Macdonald et al. (1984a)
81-0021A	Dome Petroleum (Seakem and ESL Consultants)		Temperature Salinity Current Water level Drift	Microsystems CTD-12 Aanderaa RCM-4	+0.01,0.03c° +0.03,0.07°/oo +1cm/s or 2% speed 6 +0.0003,0.01 dbar ?	3	Port Simpson Bay (Chatham Sound)	02, Wind	de Lange Boom et al. (1982)
81-00218	Dome Petroleum (Seakem and ESL Consultants)		Temperature Salinity	Applied Microsystems CTD-12	+0.01,0.03C° +0.03,0.07°/oo	3	Port Simpson Bay (Chatham Sound)	O ₂ , Wind	de Lange Boom et al. (1982)
81-0021C	Dome Petroleum (Seakem and ESL Consultants)		Temperature Salinity	Applied Microsystems CTD-12	+0.01,0.03C° +0.03,0.07°/oo	3	Port Simpson Bay (Chatham Sound)	O ₂ , Wind	de Lange Boom et al. (1982)

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure— ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area		Source or reference
81-0021D	Dome Petroleum (Seakem and ESL Consultants)	Jan.26,1982	Temperature Salinity	Applied Microsystems CTD-12	+0.01,0.03c° +0.03,0.07°/oo	3	Port Simpson Bay (Chatham Sound)	D ₂ , Wind	de Lange Boom et al. (1982)
81-0021E	MEDS/Seakem	May 1,1981- Mar.2,1982	Waves	?	?	2	Chatham Sound		CAMDI (MEDS Stn# 126)
81-0022	ENDEAVOUR, EPS, Vancouver	Aug • 4-5	Temperature Salinity	Reversing Thermometer Auto Sal 8400 Salinometer	[±.02, .03C°] [±.01, .02°/oo]	3		O ₂ , PO ₄ , NO ₃ , NO ₂ , NH ₃ , Chl.a, Sediment, Metals Benthos	
81-0023	VECTOR,	July 8-12	Temperature Salinity	CTD	?	2	Kitimat Arm	Chl.a, Clay Mineralogy, Particle Size & Concentra- tion, Sediment (traps & cores)	Macdonald et al. (1981)
81-0024A	VECTOR, IOS (Coastal Group)	May 20-23	Temperature Salinity	Guildline 8700 CTD	[±.005,.01c°] [±.005,.02°/oo]	2	Portland Inlet, Observatory Inlet,Alice Arm	Biota, Minerals (EPS)	Ford and Nicoll (1983)
81-0024в	VECTOR, TOS (Coastal Group)	Oct.16-19	Temperature Salinity	CTD	?	2	Portland Inlet, Alice Arm, Hastings Arm	Trace Metals, 0 ₂ , Biota, (species & distribution)	·
81-0050	EPS, Vancouver	Aug. 3-4	Temperature Salinity	Reversing Thermometer Salinometer	[±.02, .03c°] [±.01, .02°/oo]		Porpoise Channel, Porpoise Harbour, Wainwright Basi	0 ₂	Pomeroy (1983)
81-00530	PBS REED,	May 6-20	Temperature	XBT	[?, <u>+</u> 0.2C°]	3	Queen Charlotte Sound	Fisheries Research	Dodimead and Ballantyne (1984)
81-00531	TENACIOUS,	June 7-16	Temperature	z XBT	[?, <u>+</u> 0.2c°]	3	Hecate Strait	Fisheries Research	Dodimead and Ballantyne (1984)
81-0053	E G.B. REED,	July 5-16	Temperatur	2 XBT	[?, <u>+</u> 0.2C°]	3	Queen Charlott Sound	e Fisheries Research	Dodimead and Ballantyne (1984)
81-0053	F ARCTIC OCEAN, PBS	Aug. 7-18	Temperatur	e XBT	[?, <u>+</u> 0.2C°]	3	Queen Charlott Sound, Hecate Strait	e Fisheries Research	Dodimead and Ballantyne (1984).

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	-	Data rating number	Area		Source or reference
81-0053G	G.B. REED, PBS	Aug. 12-25	Temperature	XBT	[?, <u>+</u> 0.2C°]	3	Queen Charlotte Sound, Hecate Strait	Fisheries Research	Dodimead and Ballantyne (1984)
81-0054	VECTOR, BASTION CITY, RICHARDSON, TOS	June 23- Sept. 12	Temperature Salinity	Guildline CTD, Plessey 9400 CTD	?, ±.020° [±.005,.02°/oo	3	Alice Arm	Transmissivity	Nicoll and Stucchi (1982) Rambold and Stucchi (1983)
81-0055	ENDEAVOUR, TOS (Tides and Currents)	Feb.6- Sept.11	Water level	Aanderaa, Applied Microsystems	?	3	Hecate Strait, Dixon Entrance		IOS (cruise plan)
81-0056A	ENDEAVOUR, TOS (Tides and Currents)	Sept.7-20	Water level	Applied Microsystems	?	3	Hecate Strait		MEDS WL Stn # 9710
81-0057	Dobrocky Seatech for Amax	Apr.11-12 Apr.11- July 27	Temperature Salinity Current	Guildline 8705 CTD Aanderaa RCM-4	+.001,.005c°@ +.002@,[.02]°/oo +1 cm/s or 2% speed	3 @	Alice Arm	Suspended Sedi- ment, Dissolved Oxygen, Metal Concentrates in Sediment & Biota	
81-0058	Dobrocky Seatech for Amax	July 27 July 29- Sept.25	Temperature Salinity Current Water level	Guildline 8705 CTD Aanderaa RCM-4 Aanderaa TG3A	+.001,.005c°@ +.002@,[.02]°/oo +1 cm/s or 2% speed +.3,3 cm@	3	Alice Arm	Suspended Sedi- ment, Dissolved Oxygen, Metal Concentrates in Sediment & Biot	
81-0059	Dobrocky Seatech for Amax	Sept.24 Sept.27- Nov.22	Temperature Salinity Current	Guildline 8705 CTD Aanderaa RCM-4	+.001,.005c°@ +.002@,[.02]°/oo +1 cm/s or 2% speed	3 @	Alice Arm	Suspended Sedi- ment, Dissolved Oxygen, Metal Concentrates in Sediment & Biot	. , , , , , , , , , , , , , , , , , , ,
81-0060	Dobrocky Seatech for Amax	Nov.21-22 Nov.24,1981 -Jan.17,1982	Temperature Salinity Current ! Water level	Guildline 8705 CTD Aanderaa RCM-4 Aanderaa TG3A	+.001,.0050°@ +.002@,[.02]°/oo +1 cm/s or 2% speed +.3,3 cm@	3 .@	Alice Arm	Suspended Sedi- ment, Dissolved Oxygen, Metal Concentrates in Sediment & Biot	
81-0061	Dobrocky Seatech for Amax	Мау 23	Temperature Salinity Water level	Guildline 8705 CTD Aanderaa TG3A	+.001,.005c°@ +.002@,[.02]°/oo +.3,3 cm@	3	Alice Arm	Suspended Sedi- ment, Dissolved Oxygen, Metal Concentrates in Sediment & Biot	i .

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TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent Source or measurements reference
81-0062	Dobrocky Seatech for Amax	June 28	Temperature Salinity	Guildline 8705 CTD	+.001,.005c°@ +.002@,[.02]°/oo	3	Alice Arm	Suspended Sedi- Amax (1981) ment, Dissolved Oxygen, Metal Concentrates in Sediment & Biota
810063	Dobrocky Seatech for Amax	Aug.27	Temperature Salinity	Guildline 8705 CTD	±.001,.005C°@ ±.002@,[.02]°/oo	3	Alice Arm	Suspended Sedi- Amax (1981) ment, Dissolved Oxygen, Metal Concentrates in Sediment & Biota
81-0064	Dobrocky Seatech for Amax	Oct.27	Temperature Salinity	Guildline 8705 CTD	+.001,.005C°@ +.002@,[.02]º/oo	3	Alice Arm	Suspended Sedi- Amax (1981) ment, Dissolved Oxygen, Metal Concentrates in Sediment & Biota
81-0065	Dobrocky Seatech for Amax	Dec.19 Dec.15,1981 Jan.20,1982	Temperature Salinity - Water level	8705 CTD	+.001,.005c°@ +.002@,[.02]°/oo +.3,3 cm@	3	Alice Arm	Suspended Sedi- Amax (1981) ment, Dissolved Oxygen, Metal Concentrates in Sediment & Biota
81-0066	EPS	May 21- June 21	Temperature Salinity	Plessey 9400 CTD	[+.001,.02c°] [+.001,.03°/oo]	3	Alice Arm	Transmissivity, Goyette (pers. comm.) Residue Analy- sis, Sediment Trace Metals, Biota (tissue metal content, species composi- tion & abundance)
81-0067	EPS	Мау б	Temperature Salinity	Plessey 9400 CTD	[+.001,.02C°] [+.001,.03°/oo]	3	Alice Arm	Transmissivity, Goyette (pers. comm.) Residue Analy- sis, Sediment Trace Metals, Biota (tissue metal content, species composi- tion & abundance)

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
81-0068	EPS	Oct.20-23	Temperature Salinity	Plessey 9400 CTD	[±.001,.02c°] [±.001,.03°/00]	3	Alice Arm	Transmissivity, Residue Analy- sis, Sediment Trace Metals, Biota (tissue metal content, species composi- tion & abundance	
81-0069	PARIZEAU, TOS (Coastal & Tides & Currents) SUPERCODE	Sept.4,1981- Jan.31,1982	Current	Aanderaa	<u>+1</u> cm/s or 2% speed	0 3	Queen Charlotte Sound, Offshore Vancouver Island	I ·	Freeland et al. (1984)
82-0025A	ARRAWAC FREIGHTER, IOS	June	Salinity Temperature	AMS CTD-12	?	1	Alice Arm, Portland Inlet	Trace Metals	Stukas (1983)
82-0025B	ARRAWAC FREIGHTER, IOS	Oct.	Salinity Temperature	AMS CTD-12	?	3	Alice Arm, Portland Inlet	Trace Metals	Stukas (1983)
82-0034	PARIZEAU, 105 (Coastal Zone Cruise 03)	Jan.27-29 Jan.25- Mar.31	Temperature Salinity Current	Guildline 8700 CTD Aanderaa, Neil Brown	+.003, .010° +.005, .01°/oo +1cm/s or 2% speed	3 @	Alice Arm, Observatory Inlet, Queen Charlotte Sound	O ₂ , PO ₄ , SiO ₃ , NO ₃ , Transmissivity	Macdonald et al. (1984a) Freeland et al. (1984)
82-0036	VECTOR, TOS (Coastal Zone Cruise 05)	June 6-22 June 9- Sept.1	Temperature Salinity Current	Guildline 8700 CTD Neil Brown	+.003, .01°° +.005, .01°/oo	3	Alice Arm, Observatory Inlet	0 ₂ , PO ₄ , SiO ₃ , NO ₃ , Sediment	Macdonald et al. (1984a)
82-0037	PARIZEAU, TOS (Coastal Zone Cruise 06) UBC	Nov . 29	Temperature Salinity Current Current - Water level	Digital CTD Neil Brown Cyclesonde	[±.005,.010°] [±.005,.02°/oo] ?	2	Alice Arm, Observatory Inlet	0 ₂ , Trans- missivity	Stucchi (pers. comm.)
82-0038	VECTOR TOS (Coastal Zone Cruise 07	Nov.25-30 Nov.28,1982- Jan.16,1983	Temperature Salinity - Current	Guildline CTD Neil Brown	[±.005,.01C°] [±.005,.02°/00] ?	2	Alice Arm, Observatory Inlet	o ₂	

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?≈Unknown	•	Data cating number	Area		Source or reference
82-0039A	VECTOR, TOS (Ocean Chemistry)	Mar.24- Apr.5 Mar.31- June 10	Temperature Salinity Current	Thermometer	±.01, .020° ±.004, .01°/00	3	Observatory	Chl.a, PO ₄ , NO ₃ , SiO ₃ , Trace Metals, O ₂	Macdonald et al. (1984b)
82-0039в	VECTOR, TOS (Coastal Zone)	Apr.4-5	Temperature Salinity	Guildline 8700 CTD	+.003, .01C° +.005, .01°/oo	3	Alice Arm, Observatory Inlet		Stucchi (pers. comm.)
82-0040	VECTOR, TOS (Ocean Chemistry Group EPS	Sept.24-29	Temperature Salinity Temperature Salinity Water level	Reversing Thermometer Salinometer Plessey CTD	±.01, .02C° ±.004, .01°/oo ±.03, .05C° <u>∓</u> .03, .05°/oo	-3	Alice Arm, Observatory Inlet	O ₂ , Chl.a., SIO ₃ , NO ₃ , PO ₄ , Sediment Traps and Cores	Macdonald et al. (1984c)
82-0044	Seakem Oceanography	Oct.1,1982- May 21,1984	Waves	Waverider F1, WaveTrack, WAVEC, WRIPS	?	3	Dixon Entrance, Hecate Strait, Queen Charlotte Sound	Stations	Seakem, interim reports to MEDS
82-0045	EPS, Vancouver	Apr.29	Temperature Salinity	Plessey CTD	[±.001,.02c°] [±.001,.03°/oo]	3	Porpoise Channel, Porpoise Harbour	Transmissivity, Residue Analy- sis, Sediment, Trade Metals, Biota (tissue metal content, species composition & abundance	
82-0046	PARIZEAU, TOS, SUPERCODE	Apr.27- Sept.20	Water level Current	Foxboro (pressure Aanderaa) ? <u>+1</u> cm/s or 2% speed	3	Hecate Strait (Skidegate Channel), Queen Charlotte Sound		Freeland et al. (1984) MEDS WL Stn # 9840
82-0051	PARIZEAU, TOS (Tides and Currents)	May 19-31 d May 22- Sept.22 May 21,198 Sept.25,19		Guildline 8701 CTD CMDR-AML Aanderaa RCM-4 Aanderaa AML	[+.005,.010°] [+.005,.02°/oo] ? +1 cm/s or 2% spee +.03 cm, 3 cm @	3	Queen Charlotti Sound, Hecate Strait, Chatha Sound		CrawFord (pers. comm.)

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure— ments	Quantity measured	Instruments or methods used ?≖Unknown	Estimate of data precision and accuracy	Data rating number	Area		Source or reference
82-0052	Dobrocky Seatech for Amax	Jan•21 Jan•21- Mar•8	Temperature Salinity Current Water level	Guildline 8705 CTD Aanderaa RCM-4 Aanderaa TG3A	+1cm/s or 2% speed (+.3,3 cm @	3 0 9 3	Alice Arm	Suspended Solids, Dis- solved Oxygen, Metal Concen- tration in Sedi- ment & Biota	Amax (1982)
82-0053	Dobrocky Seatech for Amax	Mar.7-8 Mar.9- May 16	Temperature Salinity Current Water level	Guildline 8705 CTD Aanderaa RCM-4 Aanderaa TG3A	? +1cm/s or 2% speed (+.3,3 cm @	3 0 3 3	Alice Arm	Suspended Solids, Dis- solved Oxygen, Metal Concen- tration in Sedi- ment & Biota	Amax (1982) -
82-0054	Dobrocky Seatech for Amax	May 13-14 May 17- July 9	Temperature Salinity Current	Guildline 8705 CTD Aanderaa RCM-4	? <u>+1</u> cm/s or 2% speed 0	3	Alice Arm	Suspended Solids, Dis- solved Oxygen, Metal Concen- tration in Sedi- ment & Biota	Amax (1982)
82-0055	Dobrocky Seatech for Amax	July 17- Aug.2 July 10- Sept.18	Temperature Salinity Current	Guildline 8705 CTD Aanderaa RCM-4	? +1cm/s or 2% speed	3 0 @ 3	Alice Arm	Suspended Solids, Dis- solved Oxygen, Metal Concen- tration in Sedi- ment & Biota	Amax (1982)
82-0056	Dobrocky Seatech for Amax	Sept.15 Sept.19- Dec.12	Temperature Salinity Current	Guildline 8705 CTD Aanderaa RCM-4	? +1cm/s or 2% speed	3 0 @ 3	Alice Arm	Suspended Solids, Dis- solved Oxygen, Metal Concen- tration in Sedi- ment & Biota	Amax (1982)
82-0057	Dobrocky Seatech for Amax	Dec.9-10 Dec.12,1982-Apr.15,1983	Temperature Salinity - Current	Guildline 8705 CTD Aanderaa RCM-4	[±0.005,.02C°] [±0.005,.02°/oo] ±1cm/s or 2% speed	3	Alice Arm	Suspended solids, Dis- olved Oxygen, Metal Concen- tration in Sedi ment & Biota	Атах (1982) —
82-0058	ивс	Aug.	Current Temperature Salinity	Cyclesonde	?	2	Alice Arm, Observatory Inlet		Pond (pers. comm.)

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
82-0059	Dobrocky Seatech for Amax	Feb.13-14	Temperature Salinity	Guildline 8705 CTD	?	3 0	Alice Arm	Suspended Solids, Dis- solved Oxygen, Metal Concen- tration in Sedi ment & Biota	Amax (1982)
82-0060	Dobrocky Seatech for Amax	Apr.16-17	Temperature Salinity	Guildline 8705 CTD	?	3	Alice Arm	Suspended Solids, Dis- solved Oxygen, Metal Concen- tration in Sedi ment & Biota	Amax (1982) -
82-0061	Dobrocky Seatech for Amax	June 9	Temperature Salinity	Guildline 8705 CTD	?	3 0	Alice Arm	Suspended Solids, Dis- solved Oxygen, Metal Concen- tration in Sed ment & Biota	Amax (1982)
82-0062	Dobrocky Seatech for Amax	Aug.6-7	Temperature Salinity	Guildline 8705 CTD	?	3	Alice Arm	Suspended Solids, Dis- solved Oxygen, Metal Concen- tration in Sed ment & Biota	Amax' (1982)
82-0063	Dobrocky Seatech for Amax	Oct.14-15	Temperature Salinity	Guildline 8705 CTD	[+.005,.01c°] [+.005,.02°/oo]	3	Alice Arm	Suspended Solids, Dis- solved Oxygen, Metal Concen- tration in Sed ment & Biota	
82-0064	EPS	Apr.2-4	Temperature Salinity	Plessey 9400 CTD	[+.001,.020°] [+.001,.03°/00]	3	Alice Arm	Transmissivity Residue Analy- sis, Sediment Trace Metals, Biota (tissue metal content species compo	, ·
						,		tion & abunda	

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
82-0065	EPS	Apr.21-26	Temperature Salinity	Plessey 9400 CTD	[±.001,.020°] [±.001,.03°/oo]	3	Masset, Porpoise Harbour	Transmissivity, Residue Analy- sis, Sediment Trace Metals, Biota (tissue metal content, species composi- tion & abundance	
82-0066	EPS	Apr.21-26	Temperature Salinity	Plessey 9400 CTD	[+.001,.026°] [+.001,.03°/oo]	3	Alice Arm	Transmissivity, Residue Analy- sis, Sediment Trace Metals, Biota (tissue metal content, species composi- tion & abundance	
82-0067	EPS	Apr.21-26	Temperature Salinity	Plessey 9400 CTD	[±.001,.02C°] [±.001,.03°/oo]	3	Alice Arm	Transmissivity, Residue Analy- sis, Sediment Trace Metals, Biota (tissue metal content, species composi- tion & abundanc	
82-0068	ENDEAVOUR, TOS (Tides and Currents)	Sept.16-22	Temperature Salinity	Guildline 8701 CTD	[±.005,.010°] [±.005,.02°/00]	3	Queen Charlotte Sound		Crawford (pers. comm.)
83-0002A	ENDEAVOUR, 10S (Ocean Ecology Cruise 83-04)	June 28- July 15	Temperature Salinity	Guildline 8701 CTD	+.003, .010°@ <u>+</u> .005, .01°/oo@	3	Queen Charlotte Sound, Hecate Strait, Cook Bank	Chl.a, NO ₃ , NO ₂ , PO ₄ , pH, SiO ₃ , C ¹⁴ , Plankton, Light Intensity	Derman (1983) Forbes et al. (1983)
83-0002B	ENDEAVOUR, 10S (Offshore Oceanography)	July 10-16	Temperature Salinity	Guildine CTD	[±.005,.01C°] [±.005,.02°/oo]	3	Dixon Entrance, West of Oueen Charlottes and Vancouver Islan		

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
83-0003A	VECTOR, 105, RRMC Cruise OC-83- IS-003	July 10-12	Temperature Salinity	Thermometer	[<u>+</u> .02,.03G°]	2	Alice Arm, Hastings Arm, Lama Passage, Tolmie Channel, Rupert Inlet	O ₂ , NO ₃ , PO ₄ , Chl.a, Hg, Sediment, Plankton, Bentho	Thompson (1983)
83-000ЗВ	VECTOR, Cruise OC-83- IS-003 EPS Vancouver	July 5-11	Temperature Salinity	Plessey CTD	[+.001,.02c°] [+ .001,.03°/oo]	3	Rupert Inlet, Holberg Inlet, Observatory Inlet, Alice Arm	Benthos, Transmissivity	Goyette (pers. comm.)
83-0014	VECTOR, 10S (Coastal Zone Group Cruise 08)	Jan.14-21 Jan.17- Apr.15	Temperature Salinity Current	Guildline 8700 CTD Neil Brown, Aanderaa	+.003,.010° T .005,.010/oo ? +1cm/s or 2% speed	3 @	Alice Arm, Observatory Inlet	0 ₂ , Sediment	Macdonald et al. (1984a)
83-0015	VECTOR, TOS (Coastal Zone Group Cruise 09)	Apr.13-18	Temperature Salinity	Guildline CTD	[±.005,.01C°] [±.005,.02°/oo]	3	Alice Arm, Observatory Inlet	02	Stucchi (pers. comm.) Macdonald et al. (1984a)
83-0021	CHS	June 9- Sept.29	Water level	Ottboro (pressure)	?	3	Dixon Entrance Queen Charlotte Sound		MEDS WL Stn # 8958, 8974, 8978, 9958
83-0034	Charter Boat, IOS (Tides and Currents)	Jan.22- Sept.28	Water level	AML	?	3	Queen Charlott Sound	e	
830035	PARIZEAU, TOS (Tides and Currents, Offshore Oceanography)	Apr.29- 1 May 20	Water level Wave Current Temperature Salinity	750Å AAND, CMDR, GEOD, M-Mc	+0.3 cm, 3 cm @ ? ? [+.005,.01C°] [+.005,.02°/oo]	3	Queen Charlott Sound, Hecate Strait	e	
83-0036	A PARIZEAU, TOS (Offshore Oceanography)	Sept.5-17	Water level Temperature Salinity		? [±.005,.01C°] [±.005,.02°/oo]	3	West Coast of Queen Charlott Islands, Queen Charlotte Soun Dixon Entranco	n 1 đ ,	

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TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure- ments	Quantity measured	Instruments or methods used ?=Unknown		Data rating number	Area	Concurrent measurements	Source or reference
83-0036в	PARIZEAU, TOS (Tides and Currents)	Sept.18-29	Current Water level Temperature Salinity	CMDR, Aanderaa AML, TG3A Guildline CTD	? +1 cm/s or 2% speed 7 +.3,3 cm @ [+.005,.01C°] [±.005,.02°/00]	3 @		0 ₂ , Nutrients Bird Watcher Observations	
83-0037	Dobrocky Seatech for Amax	Apr.15	Temperature Salinity	Guildline 8705 CTD	+.001,.005c°@ +.002@,[.02]°/oo	3		Suspended Solids, Dis- solved Oxygen, Metal Concen- tration in Sedi- ment & Biota	Amax (1982)
83-0038	EPS	Apr.22	Temperature Salinity	Plessey 9400 CTD	[+.001,.020°] [+.001,.03°/oo]	3	Harbour .	Transmissivity, Residue Analy- sis, Sediment Trace Metals, Biota (tissue metal content, species composi- tion & abundanc	
83-0039	EPS	Oct.5-6	Temperature Salinity	Plessey 9400 CTD	[+.001,.02c°] [+.001,.03°/oo]	3	Alice Arm	Transmissivity, Residue Analy- sis, Sediment Trace Metals, Biota (tissue metal content, species composi tion & abundance	
84-0001	PARIZEAU, TOS (Tides and Currents, Offshore Oceanography)	Jan•11-21	Current Water level Temperature Salinity	Aanderaa CMDR TG12 Guildline CTD	+ 1cm/s or 2% speed +.3,3 cm @ [+.005,.01C°] [+.005,.02°/oo]	@ 3	Queen Charlotte Sound, Hecate Strait		
84-0002	PARIZEAU, TOS (Tides and Currents, Offshore Oceanography)	Apr.11-26	Current Water level Temperature Salinity	AML	? +.3,3 cm @ ? [+.005,.01C°] [+.005,.02°/00]	3	Queen Charlotte Sound, Hecate Strait, Dixon Entrance		
84-0003	Helicopter, IOS (Tides and Currents)	Apr.	Temperature Salinity Current (profiles)	Hydrolab CTD Marsh-McBirney	?	2	Mouth of Skeena River		Ages (pers. comm.)

TABLE 2: SUMMARY LISTING OF DATA SETS (Continued)

Data Set I.D.	Ship or collecting agency	Dates of measure— ments	Quantity measured	Instruments or methods used ?=Unknown	Estimate of data precision and accuracy	Data rating number	Area	Concurrent measurements	Source or reference
84-0005	EPS	July 6-7	Temperature Salinity	Plessey 9400 CTD	[+.001,.02c°] [+.001,.03°/oo]	3	Alice Arm	Transmissivity, Residue Analy- sis, Sediment Trace Metals, Blota (tissue metal content, species composi tion & abundance	
84-0006	Dobrocky Seatech Ltd.	June 12-25	Temperature Salinity Drift	Guildline 8706 CTD Loran-C Drifters	[+.003,.01c°] [+.005],.05°/oo ?	3	Dixon Entrance		Greisman (pers. comm.)
84-0007	PARIZEAU, 10S (Offshore Oceanography)	Oct.14-31	Temperature Salinity	Guildline 8701 CTD	[+.005,.01C°] [+.005,.02°/oo]	3	Dixon Entrance	02	Thomson (pers. comm.)

9. MAPS

This section contains maps showing the yearly distribution of temperature, salinity, current, water-level, wave, and surface-drift measurements. One overall map and up to five additional sub-maps are used (Figure 20). All are Lambert Conformal Conic projection with maps 1 through 6 having scales 1:2.9, 1.6, 1.7, 1.4, 1.5 and 1.5 million, respectively.

Generally, temperature-salinity and any water-level stations are plotted together. If there were also current-meter data, then the first map will have only temperature-salinity, and the current and water-level data will be displayed on a second map. Wave data have usually been plotted with current and/or water-level data. The overall map generally contains all the stations; the sub-maps provide more detail and several may be used to display station positions in one area.

For some data sets, exact locations are not known. A "?" on the first map is used to indicate the general area, if known.

The legend indicates the following data types:

CM - current-meter data

DRF - drifter data

TS - temperature-salinity data

WL - water-level data

WAVE - wave data

The coastlines have been smoothed and small islands removed. A minimum displacement of 0.03 inch is required for a new station to be plotted. This was implemented to prevent the plotter from wearing through the paper in heavily sampled locations. Vessel/agencies in the legend are abbreviations. Note that cruise station symbols may be different on two different maps.

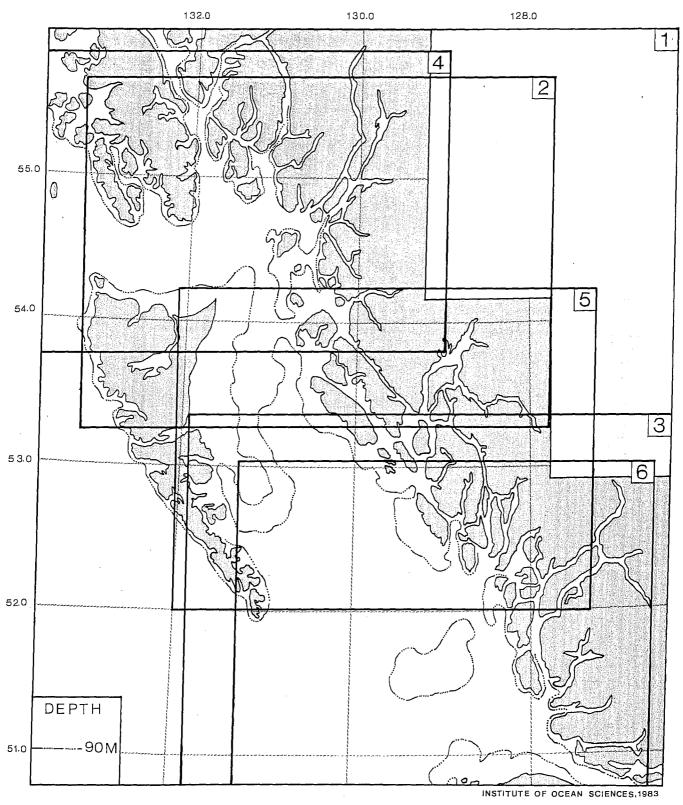
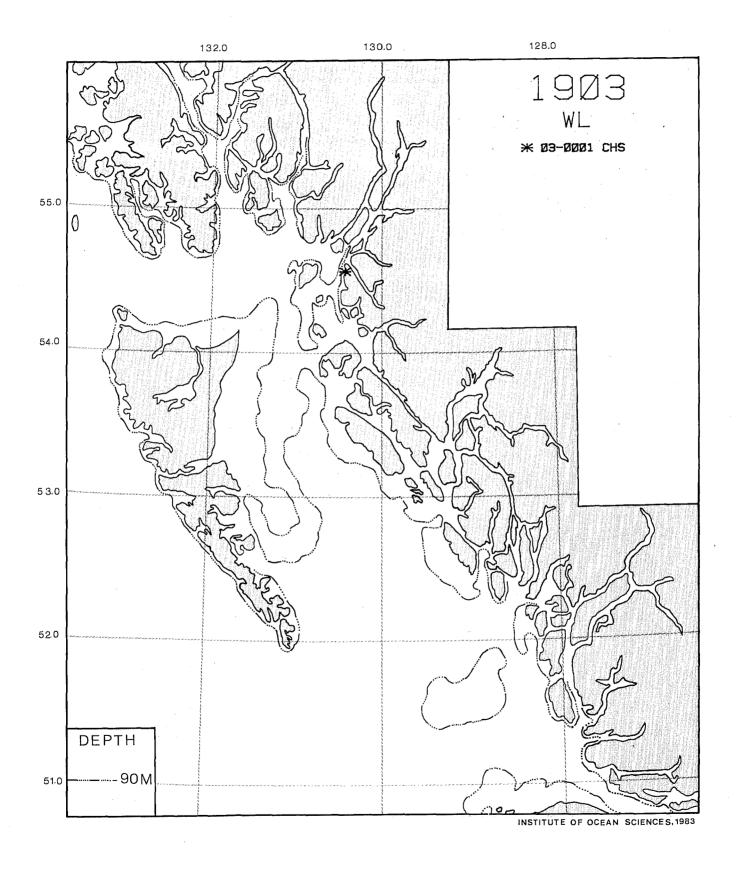
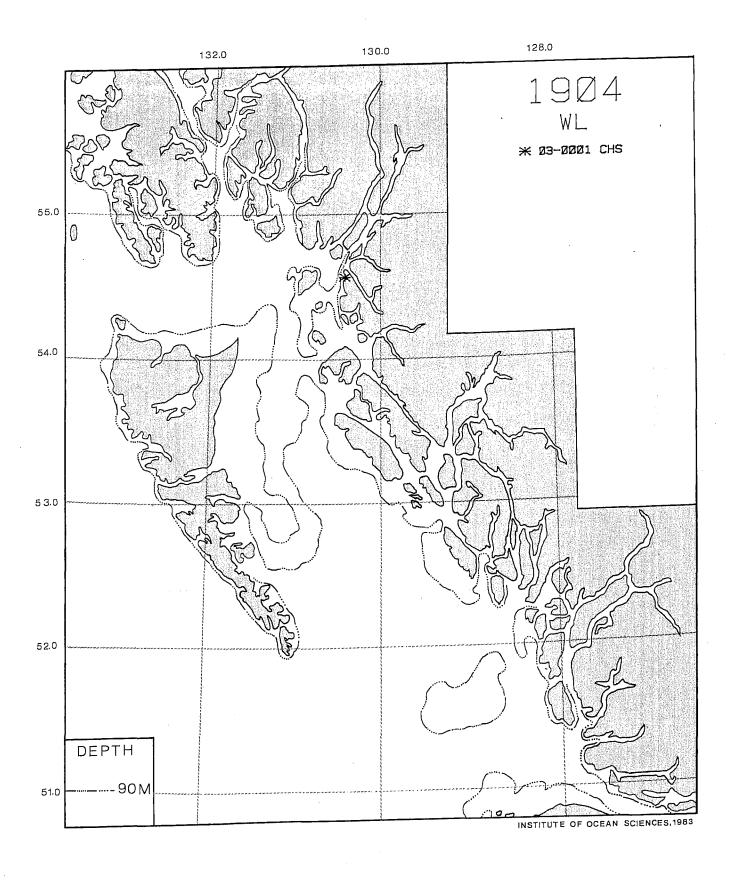
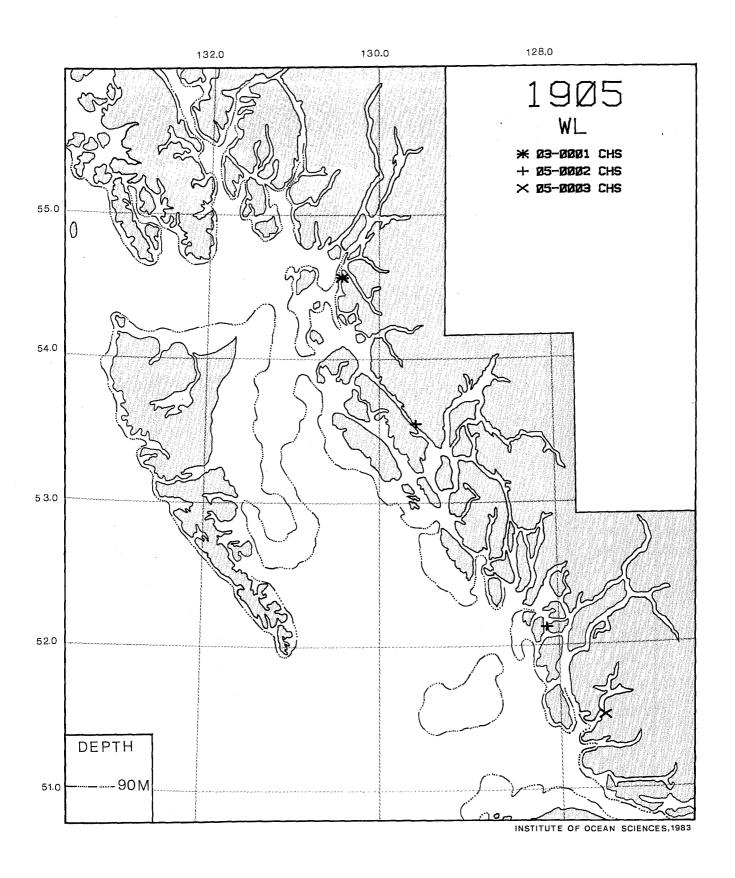
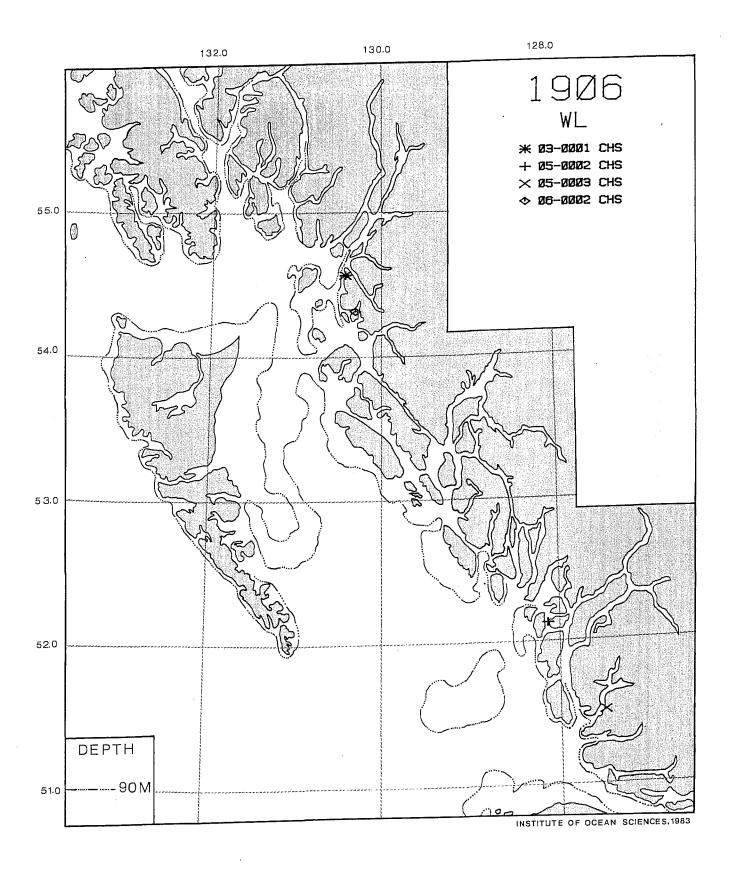


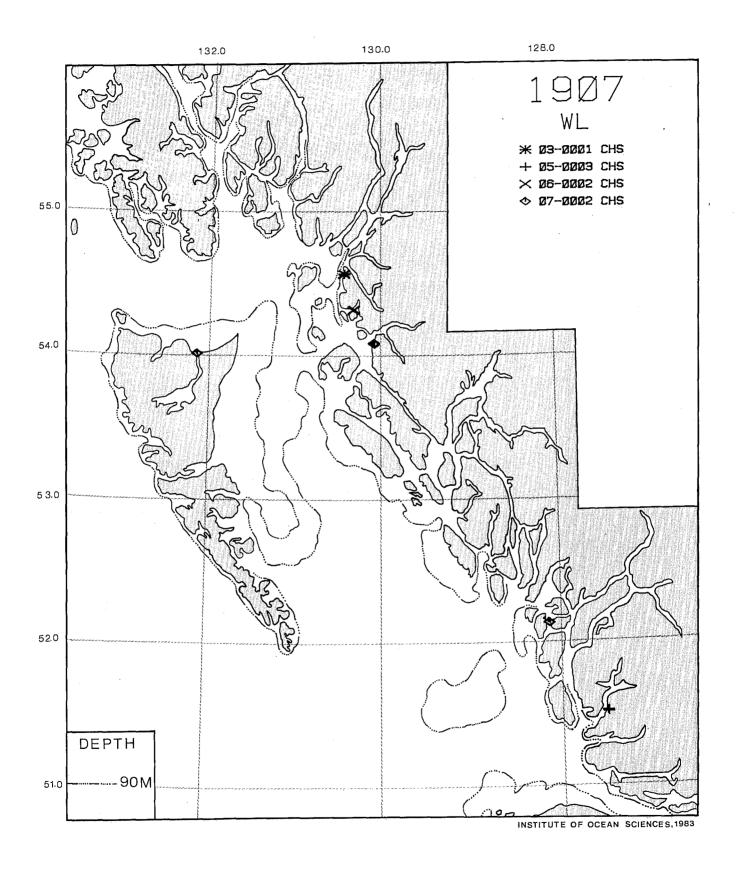
Figure 20: Maps used to plot station locations. All are Lambert Conformal Conic projection.

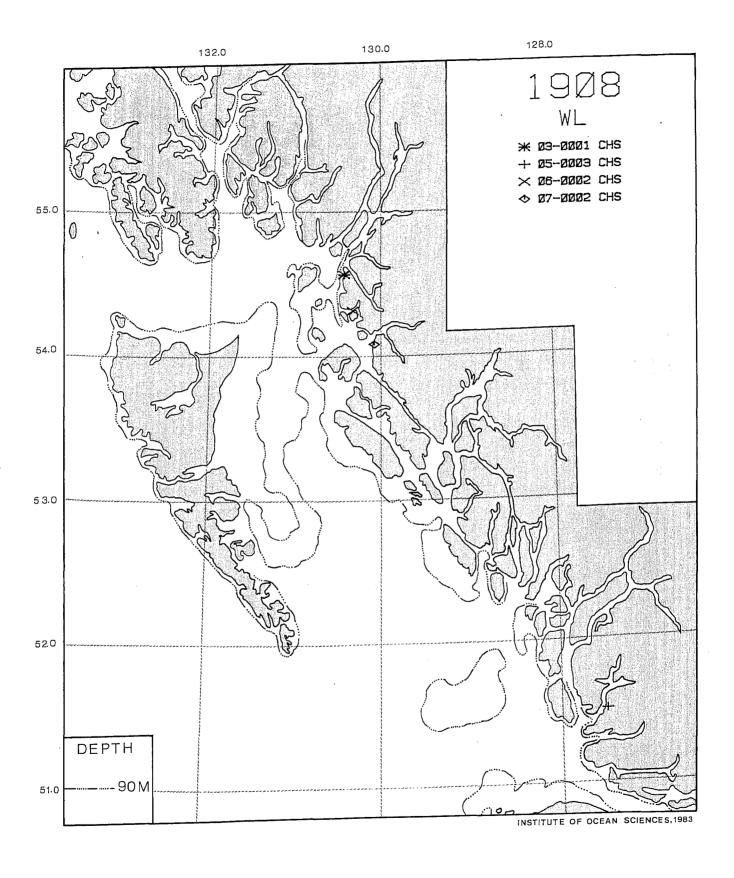


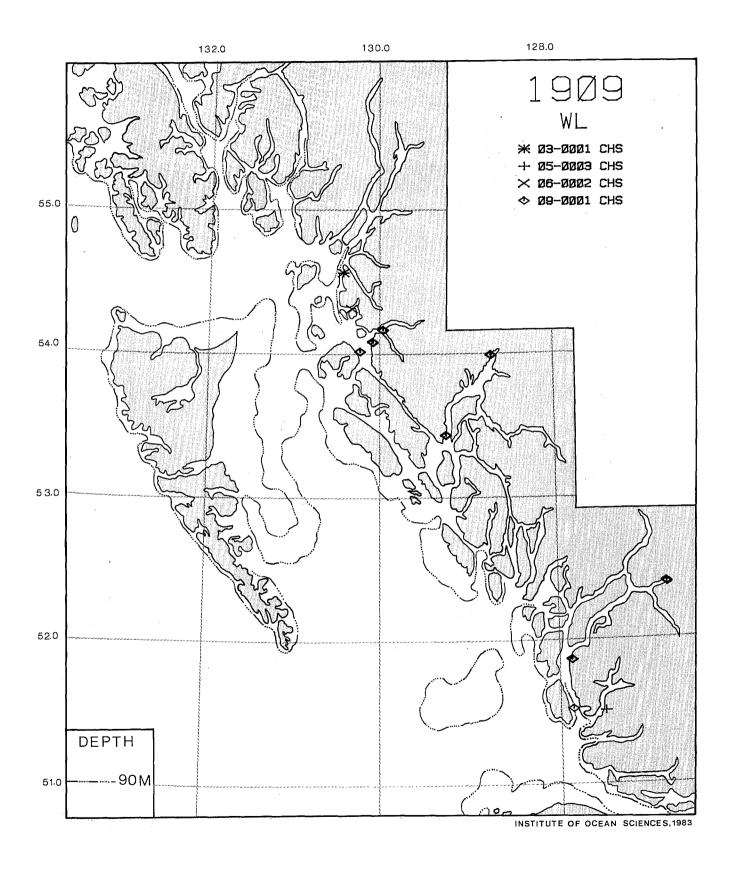


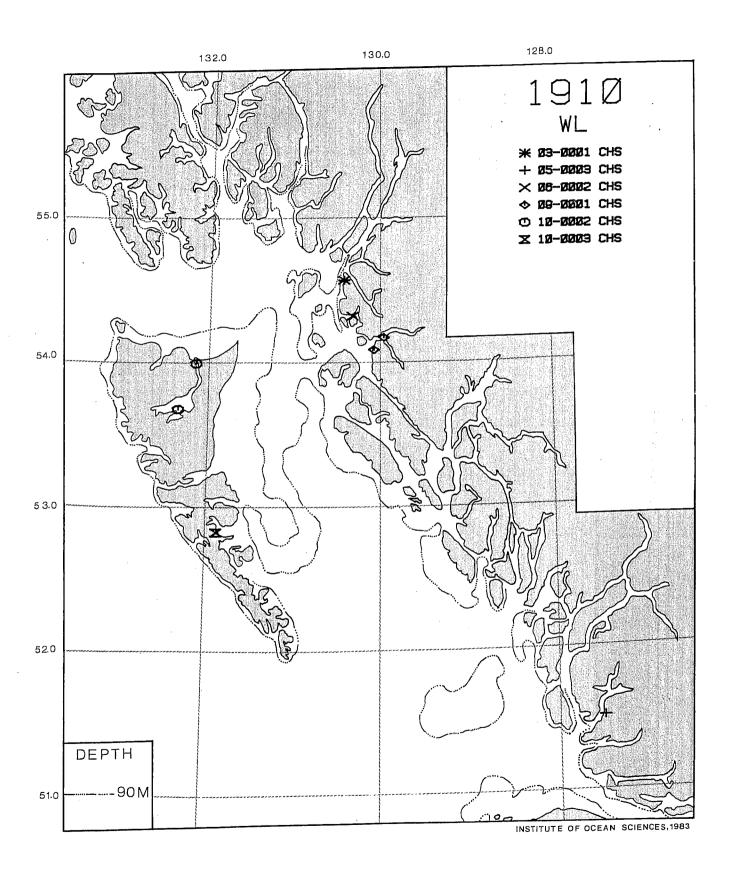


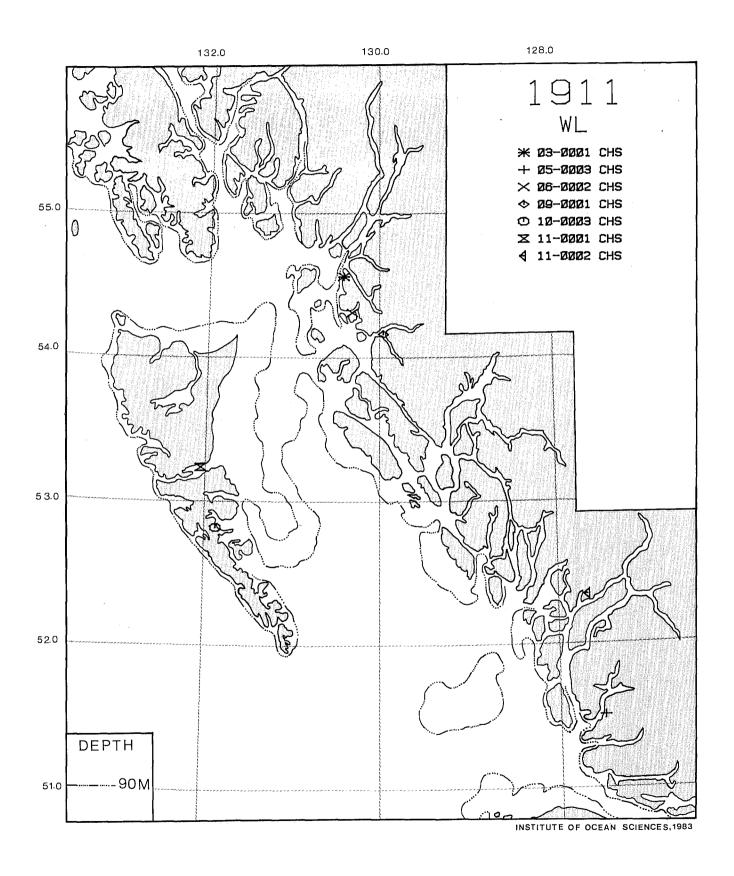


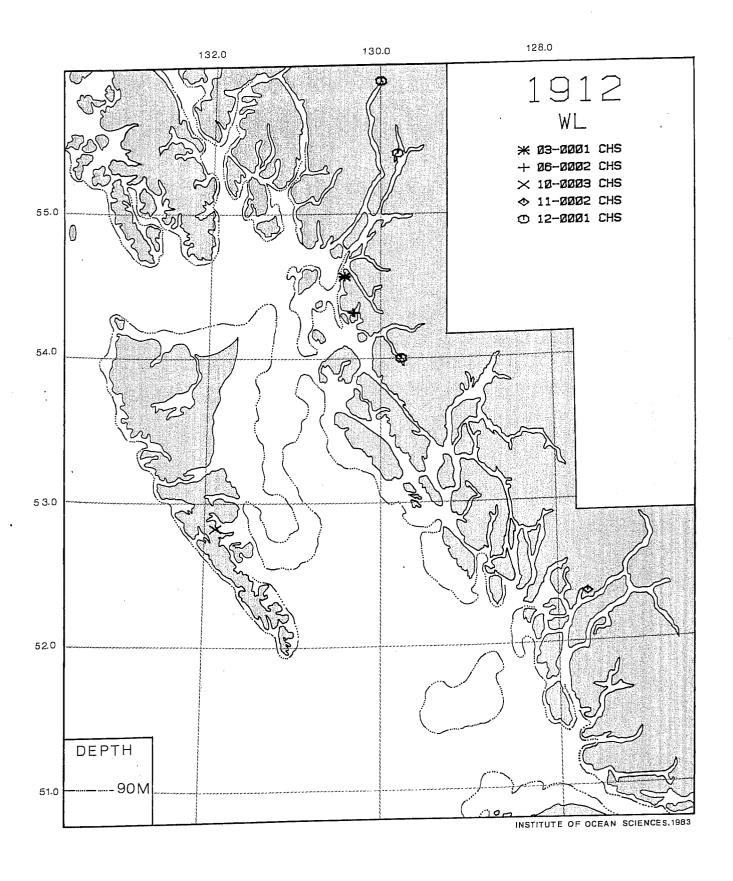


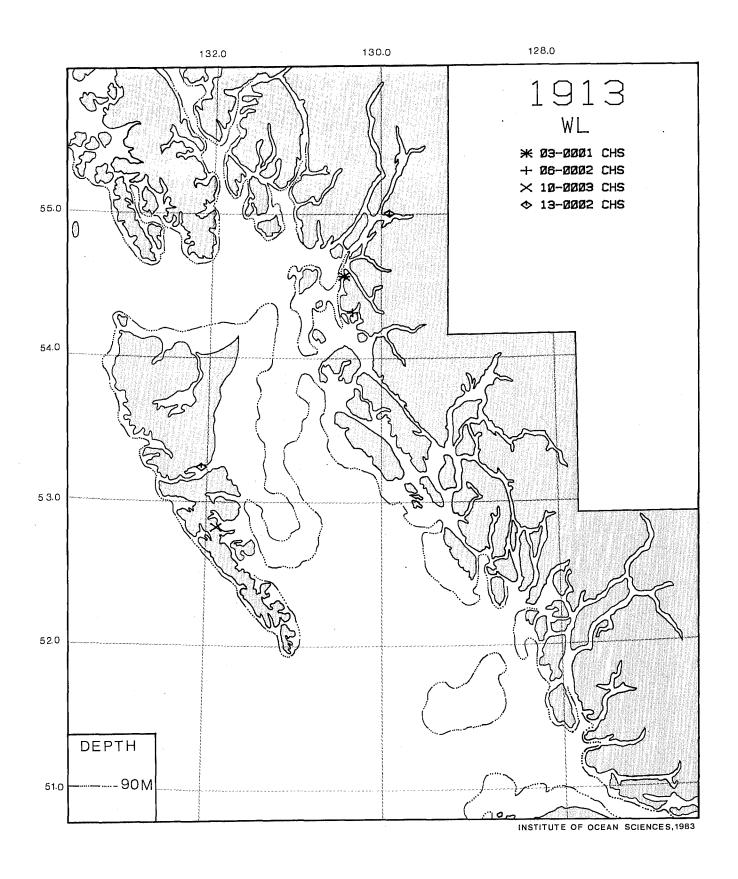


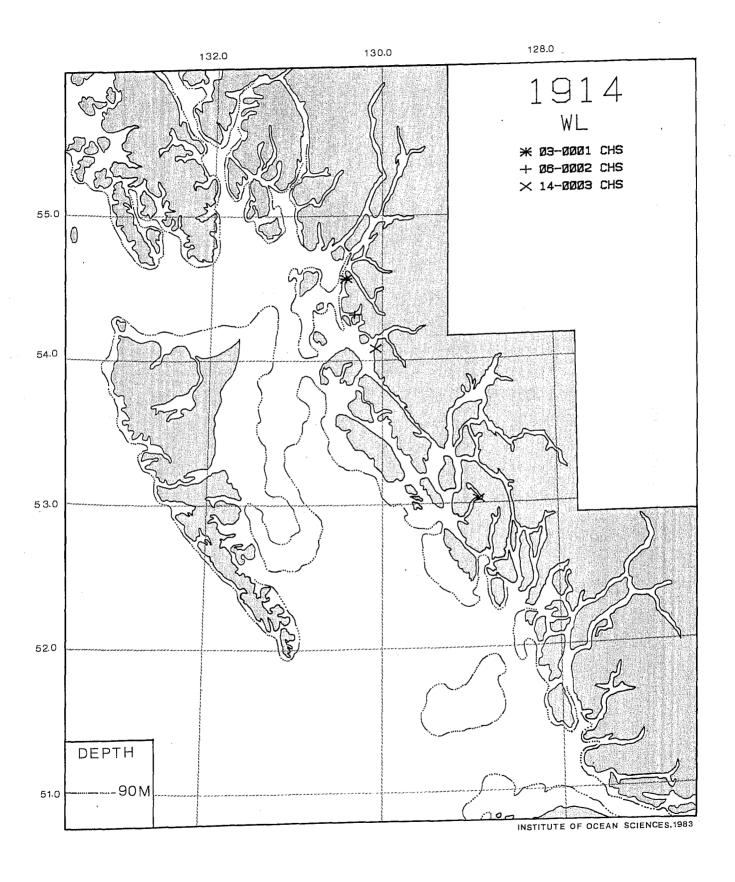


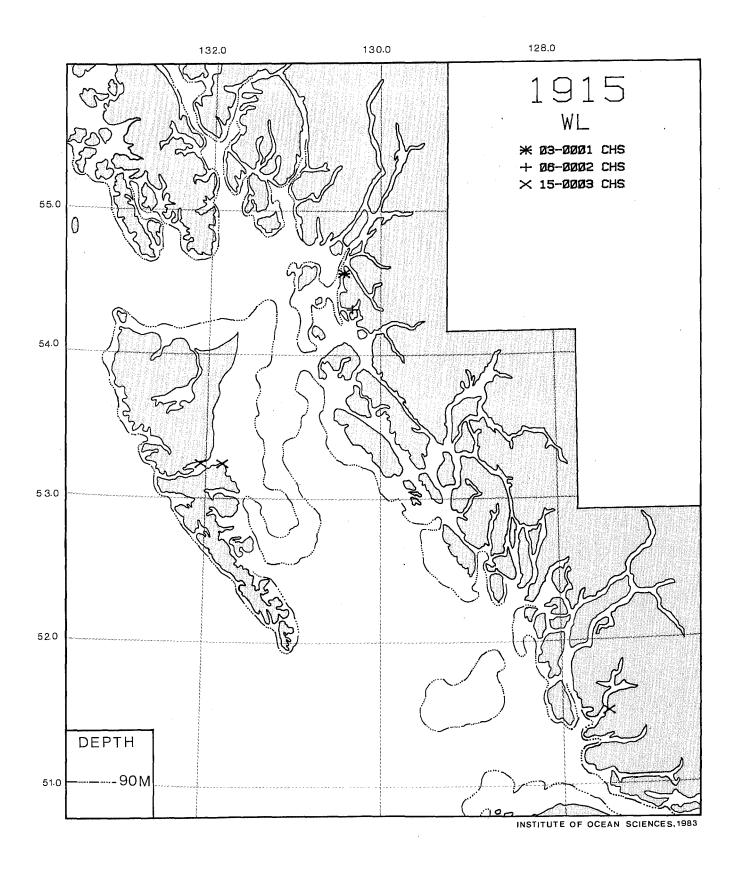


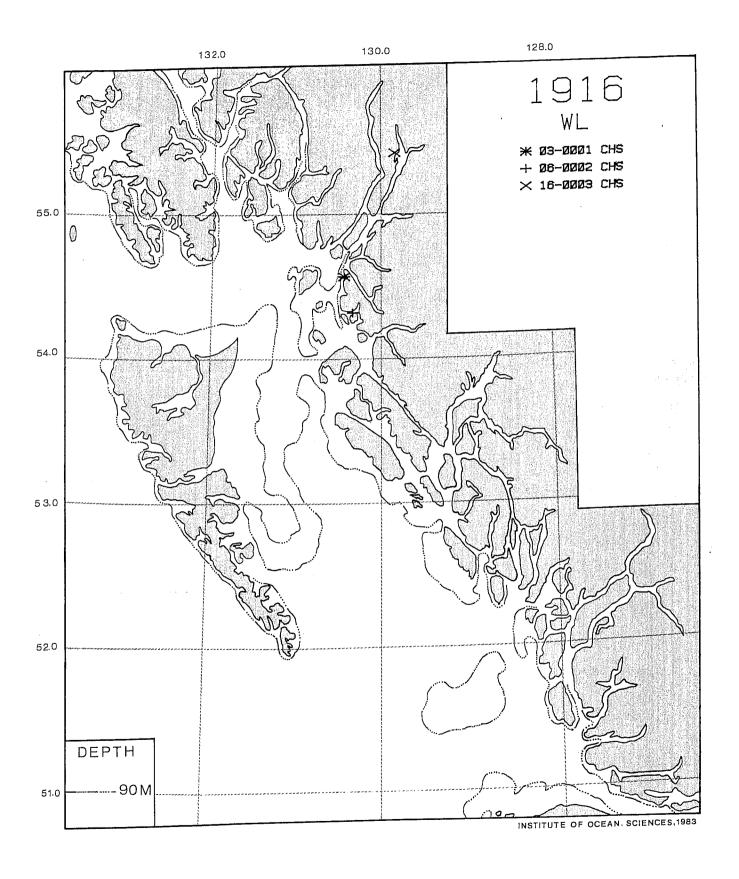


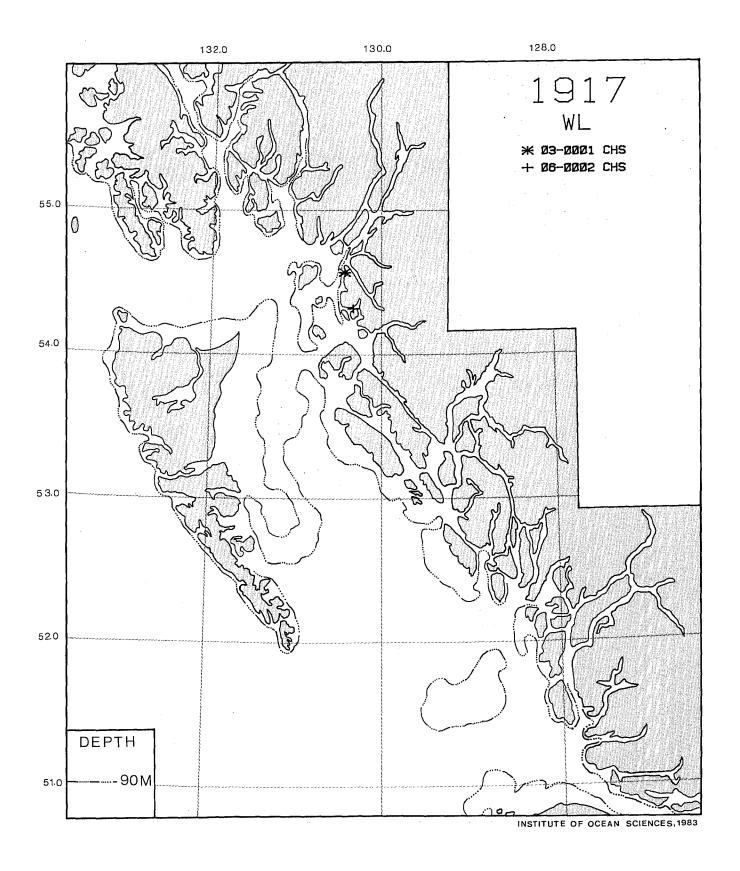


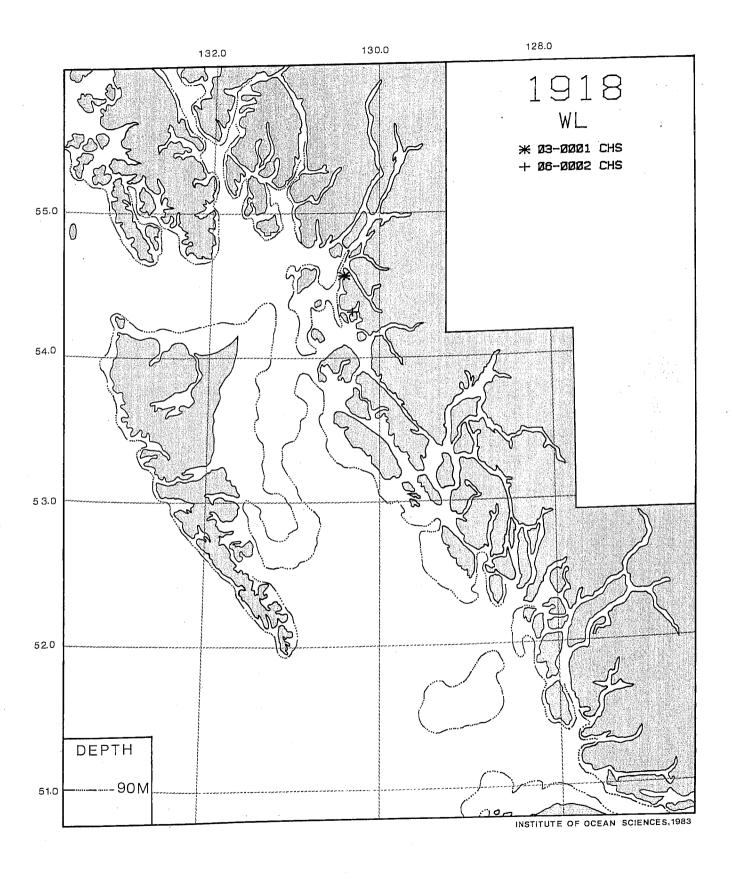


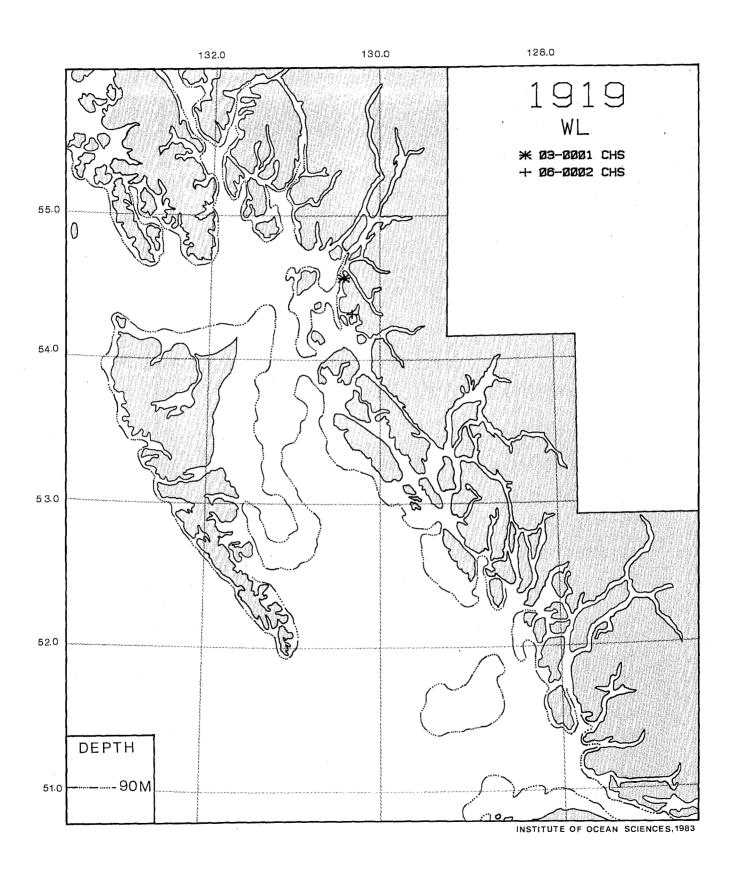


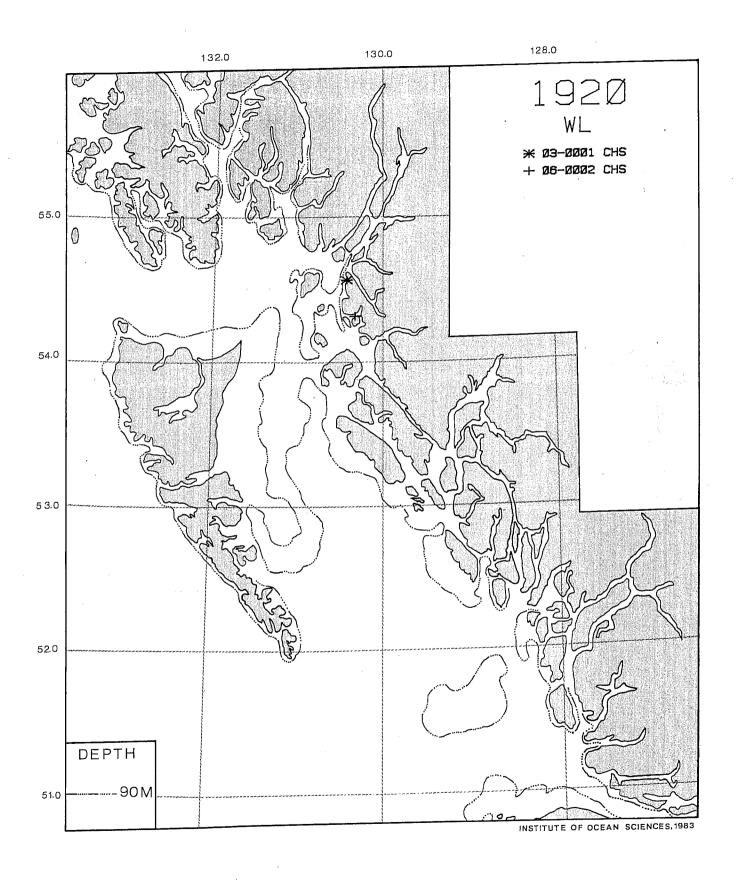


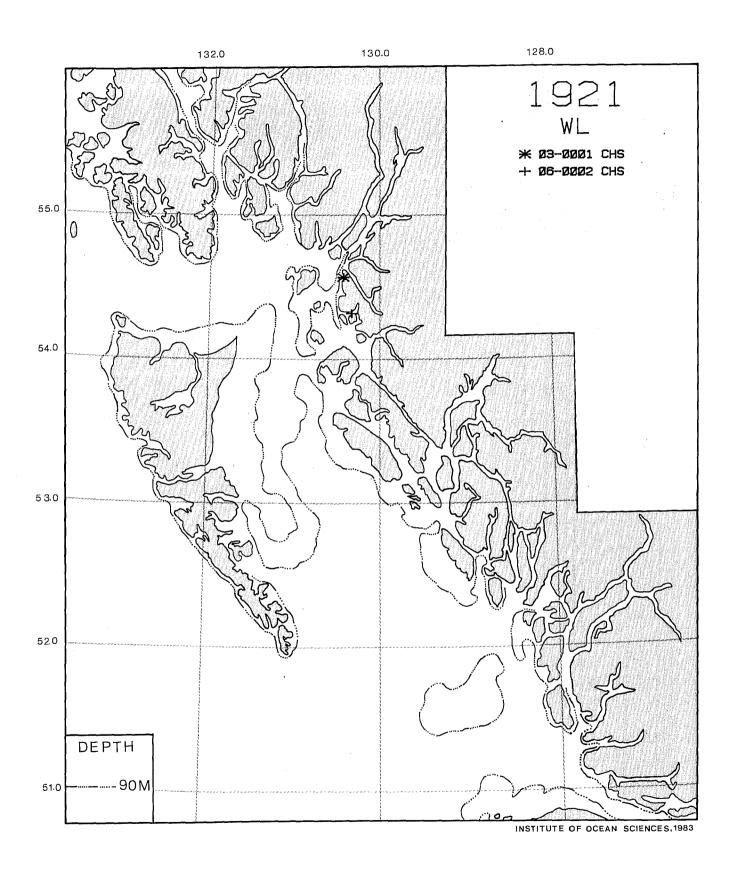


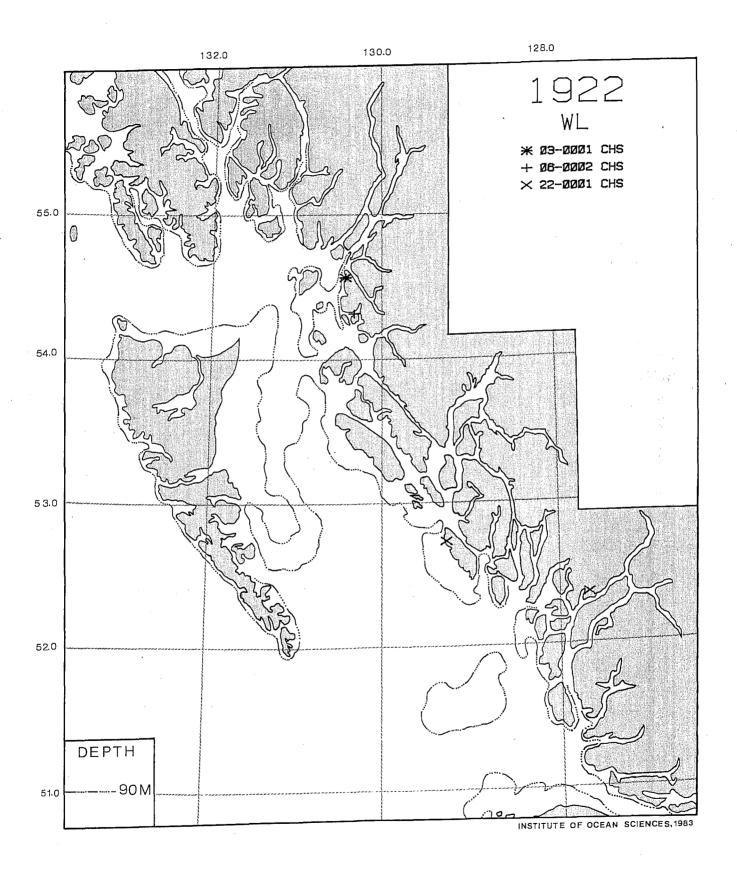


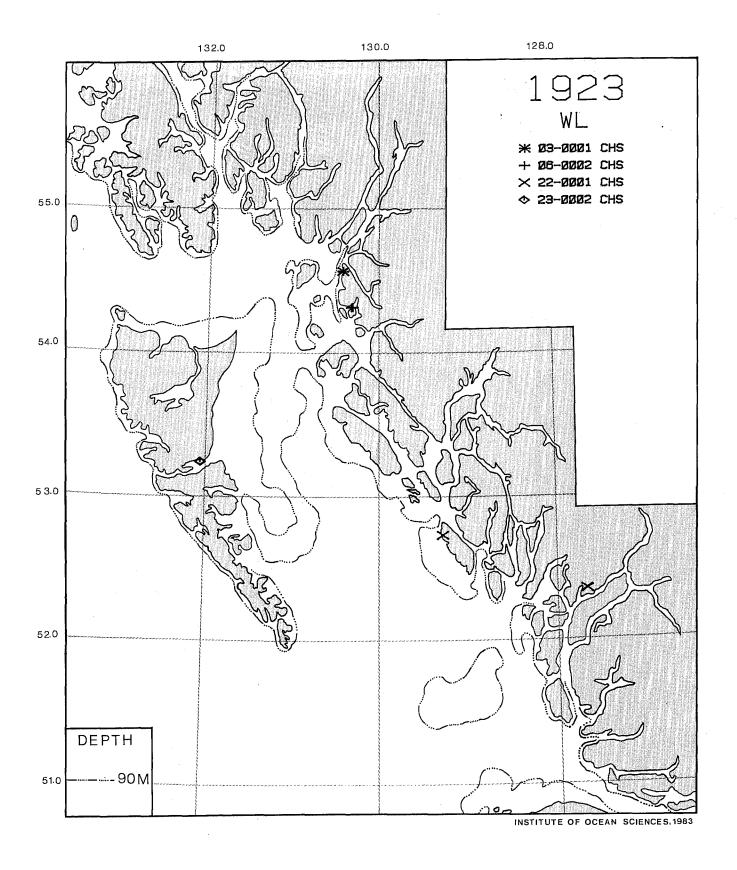


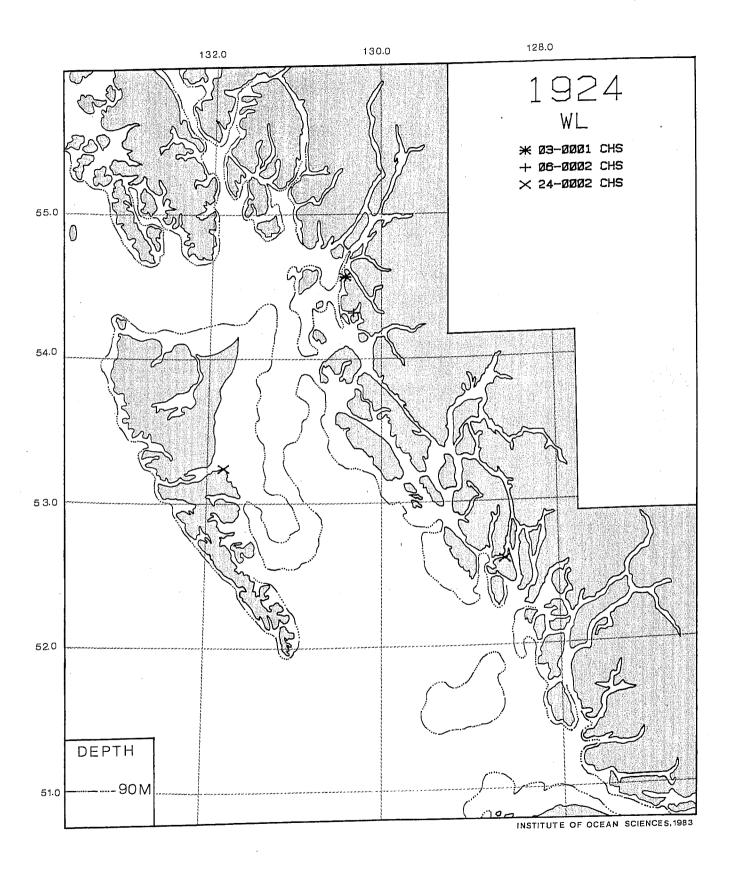


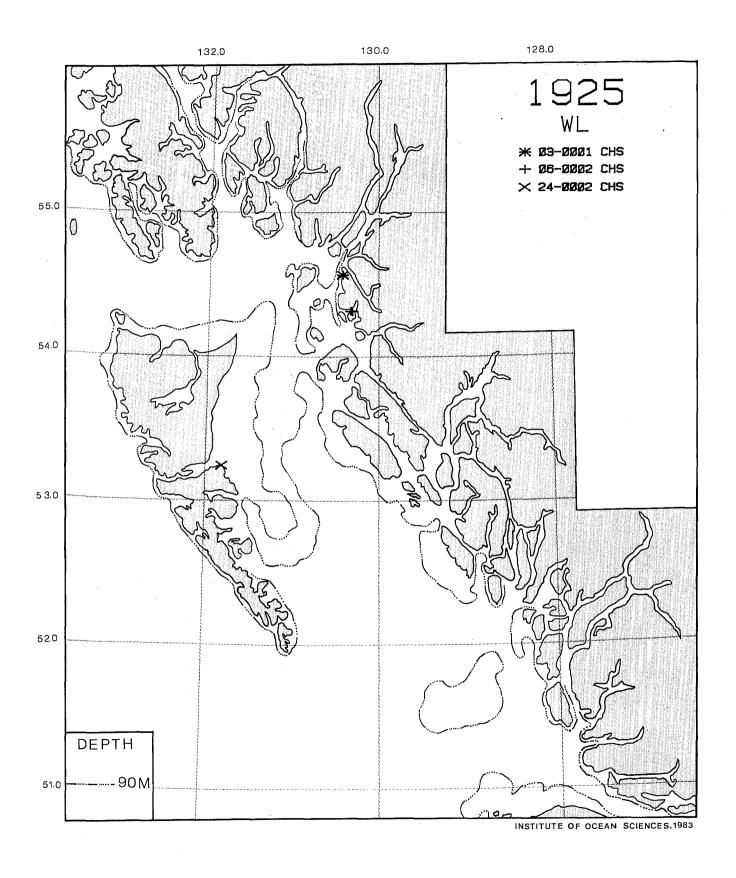


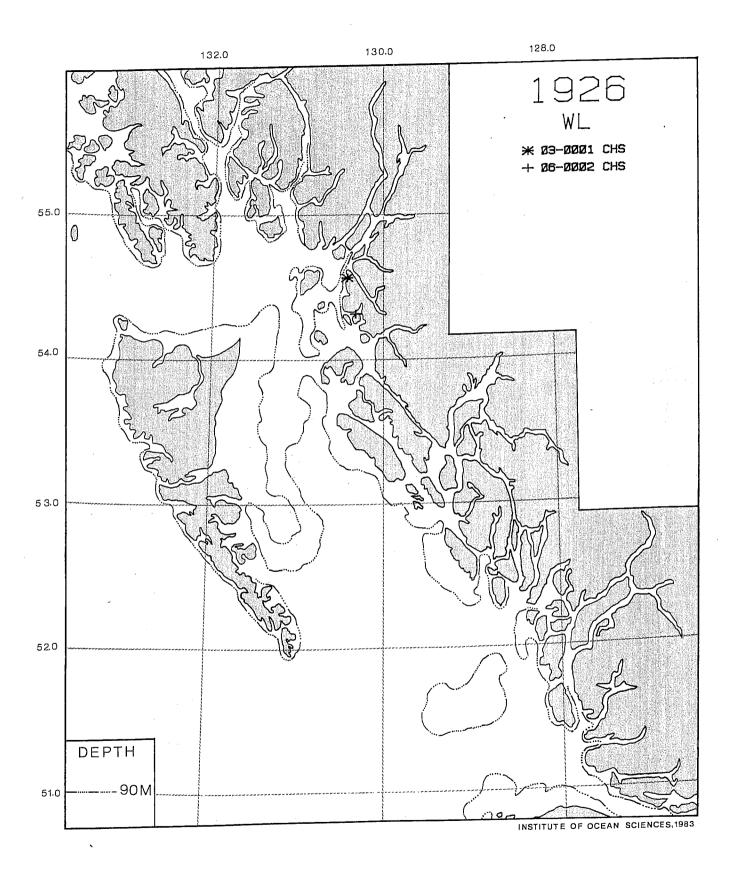


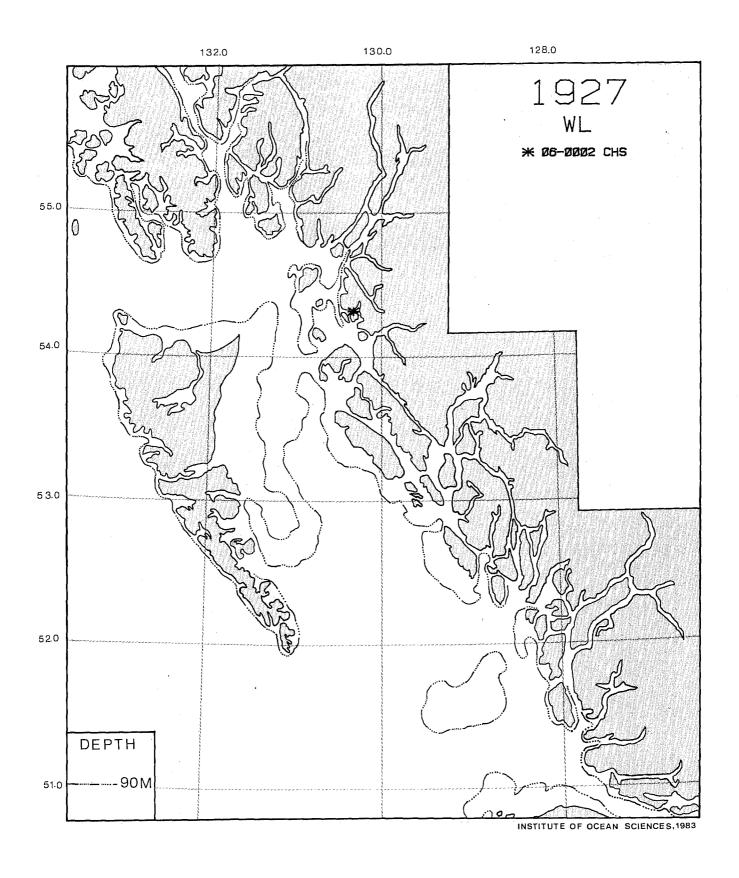


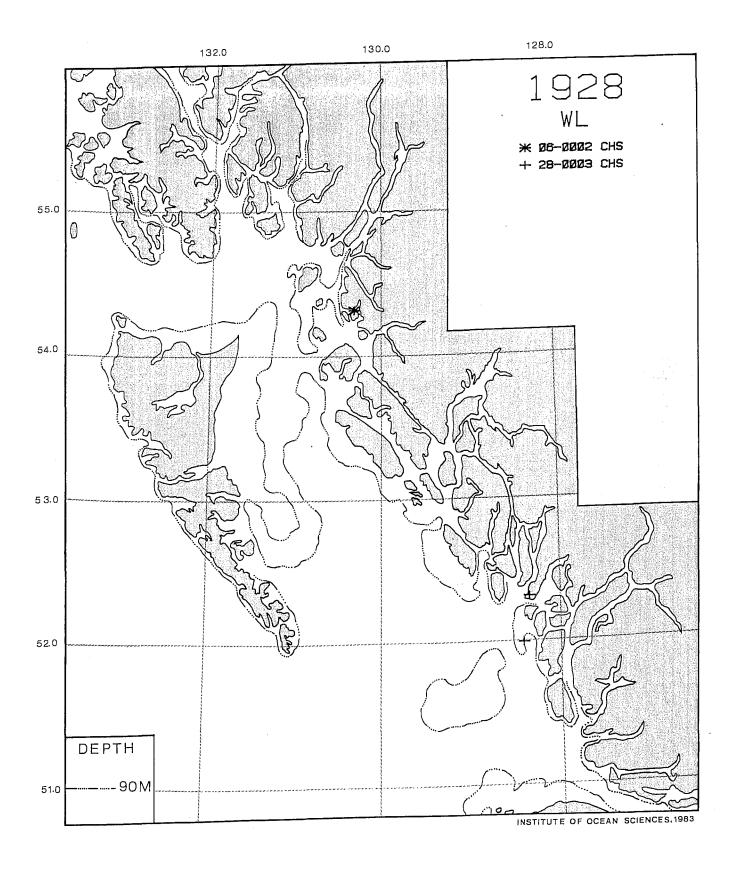


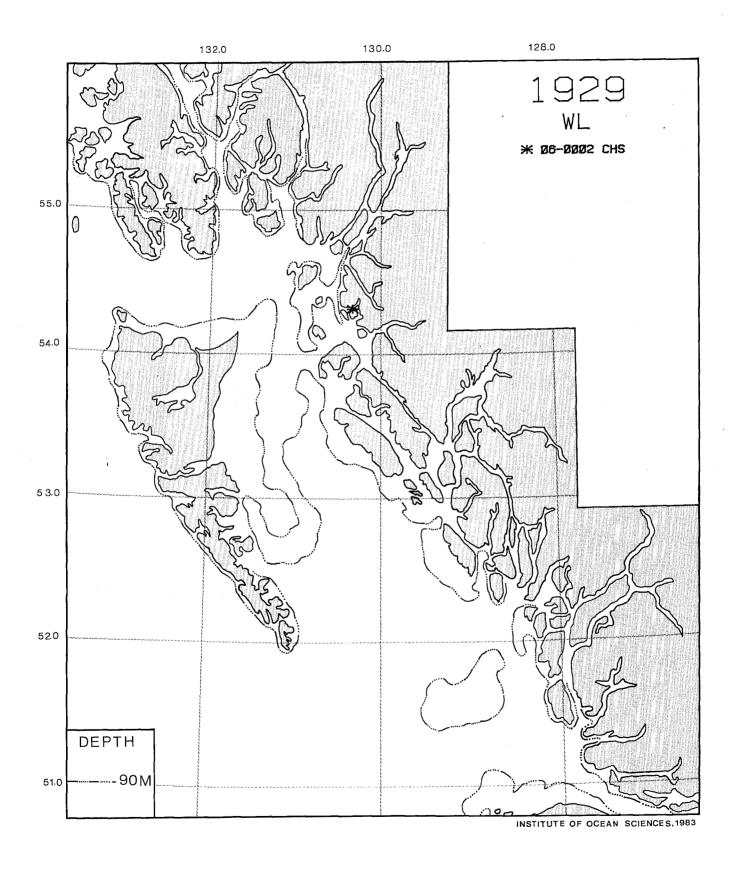


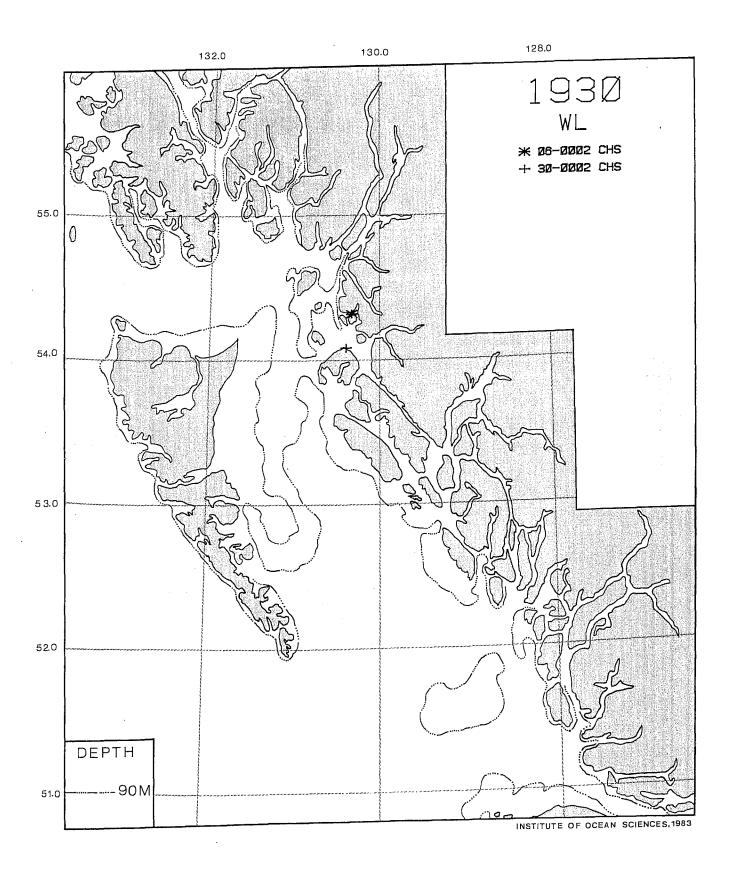


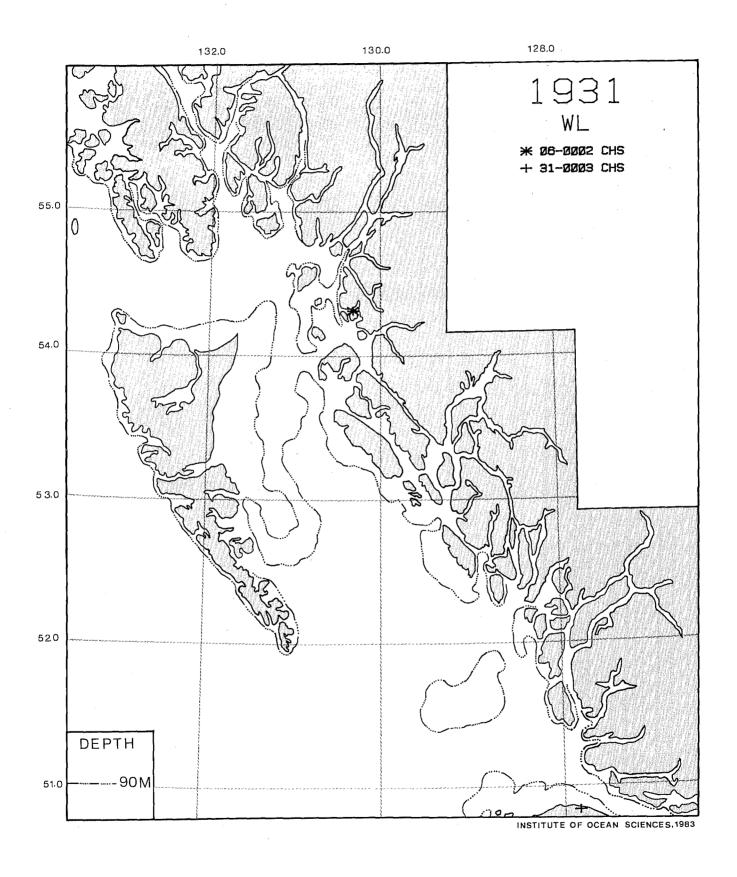


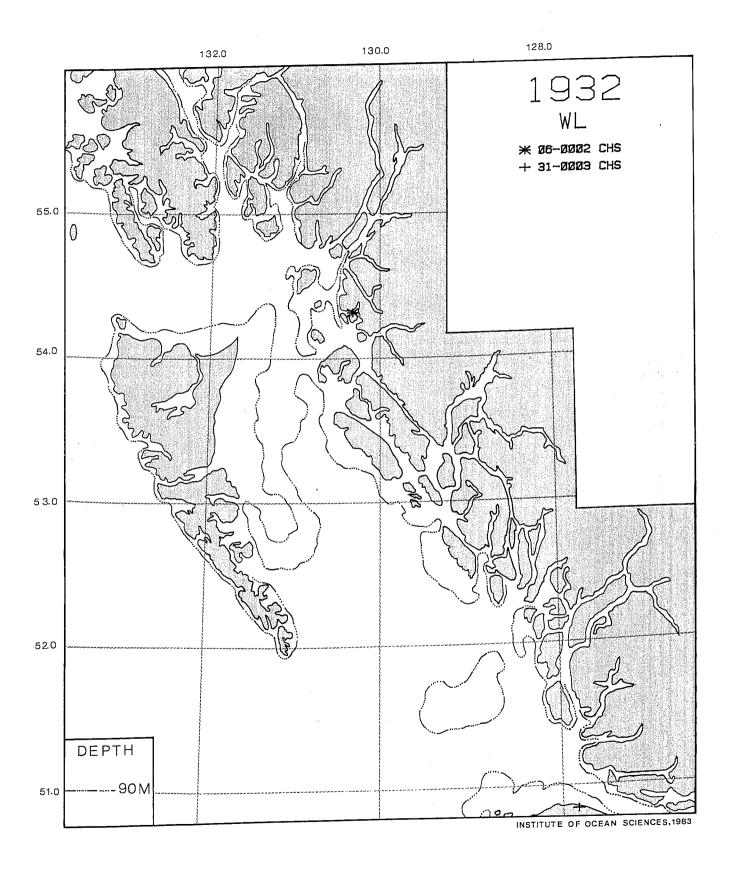


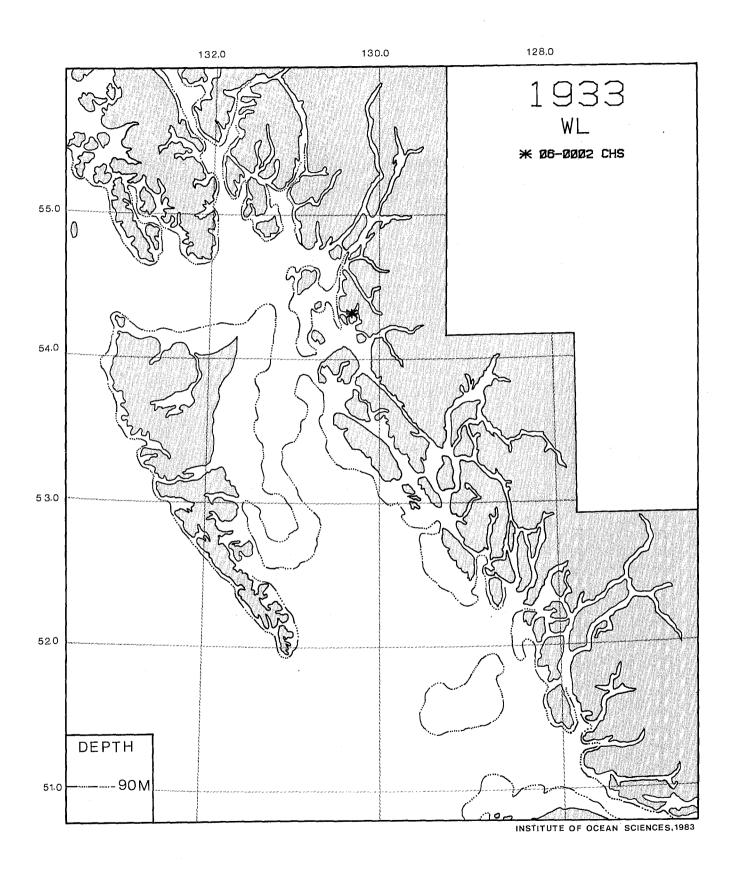


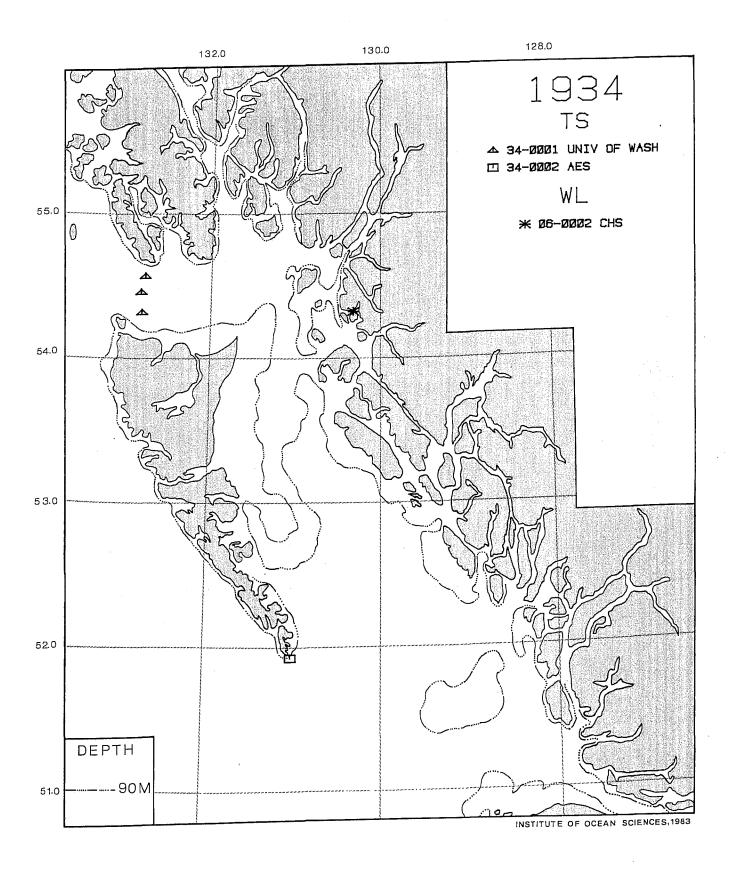


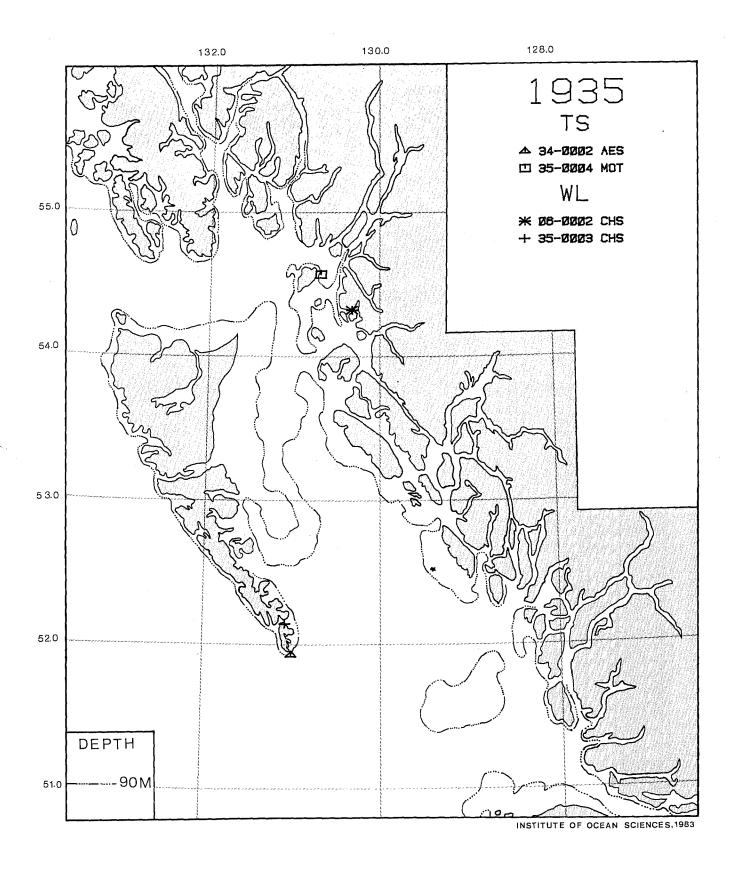


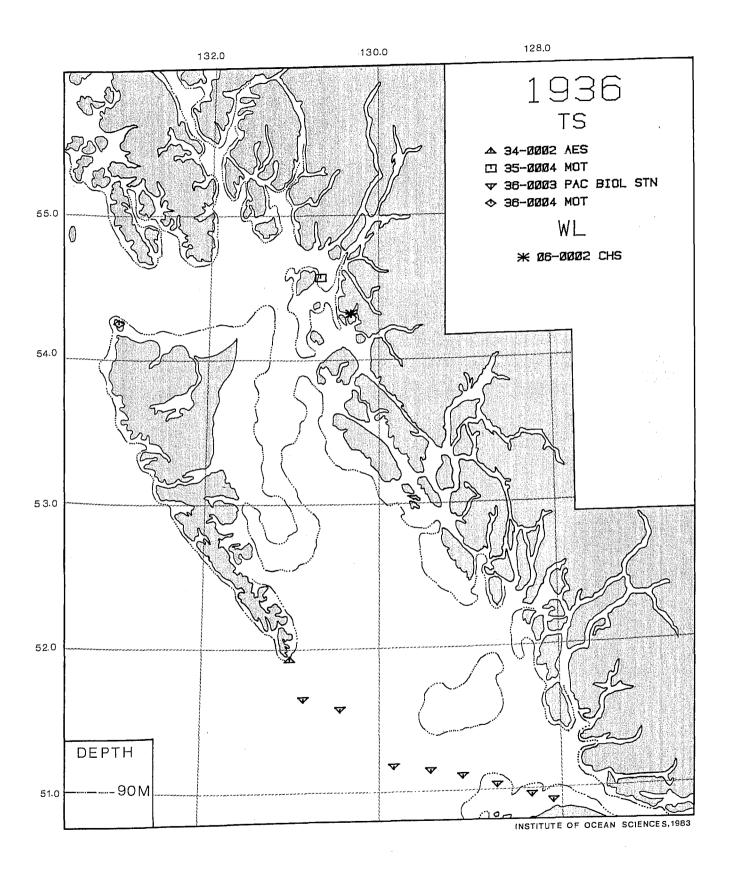


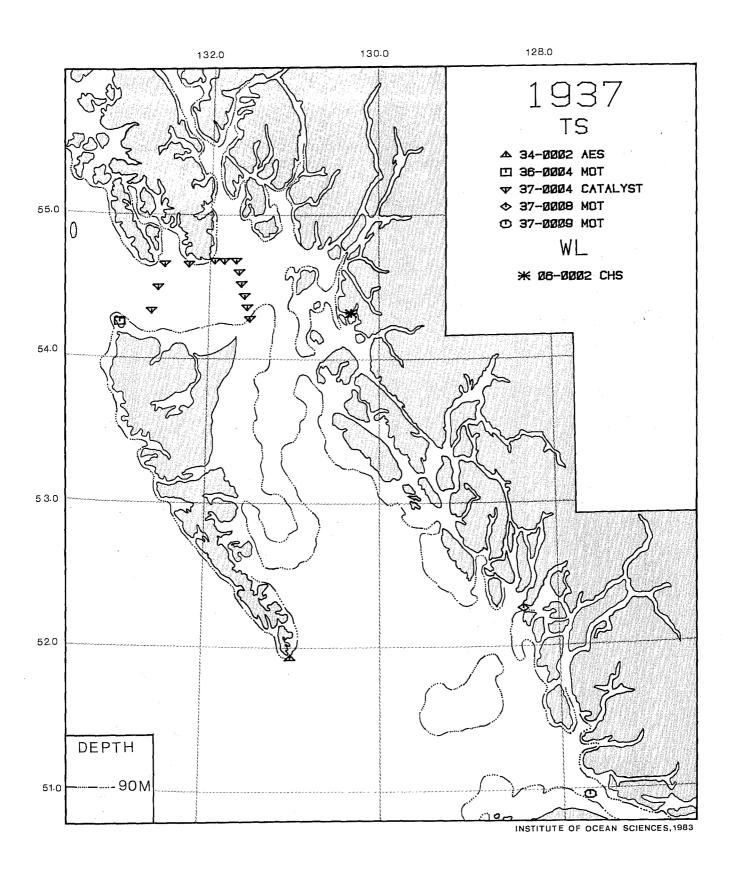


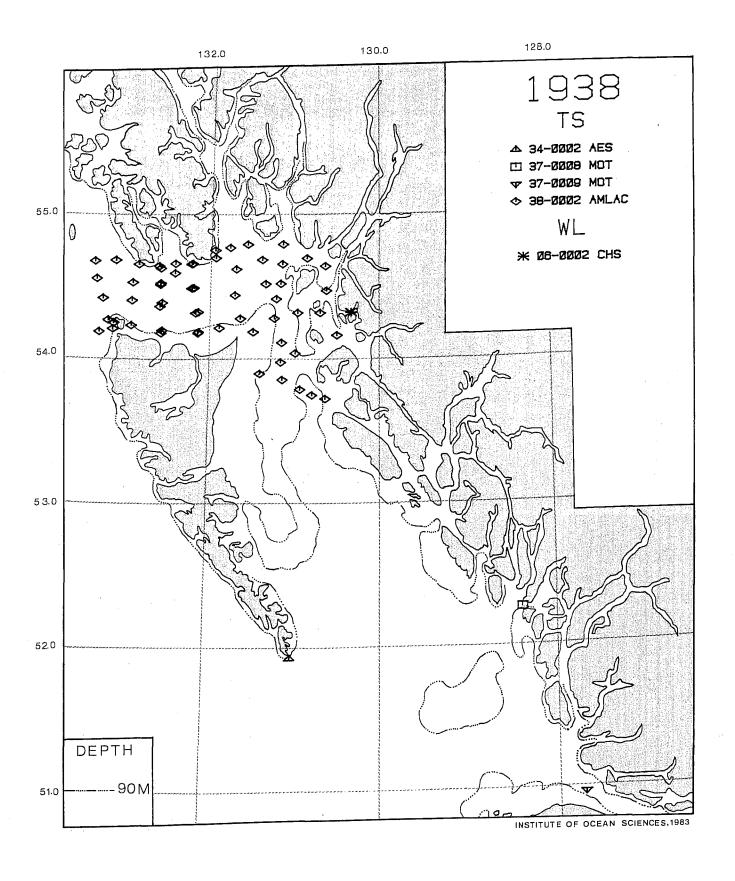


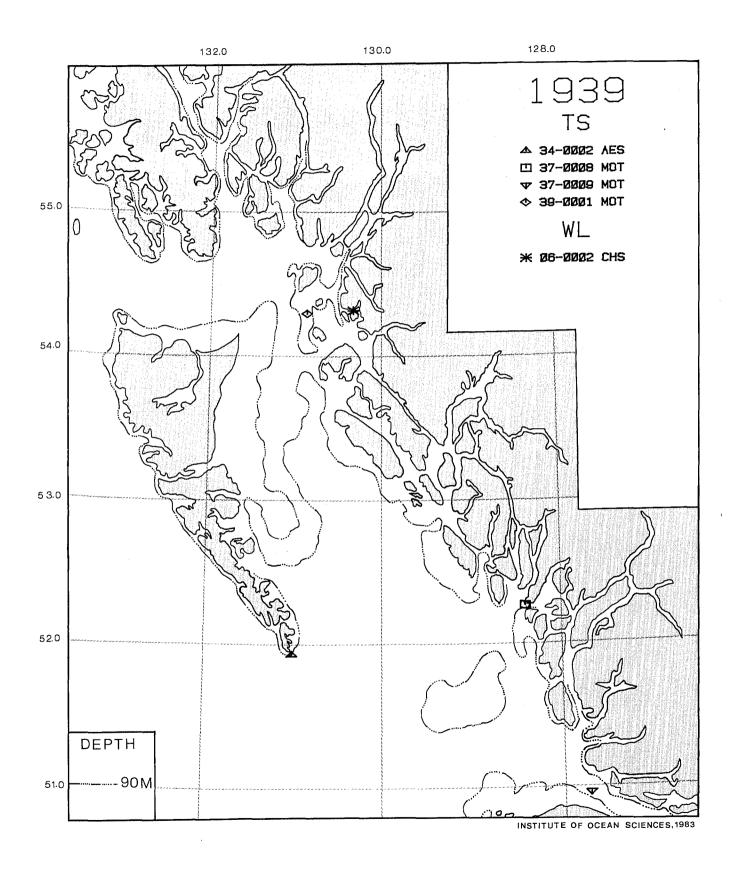


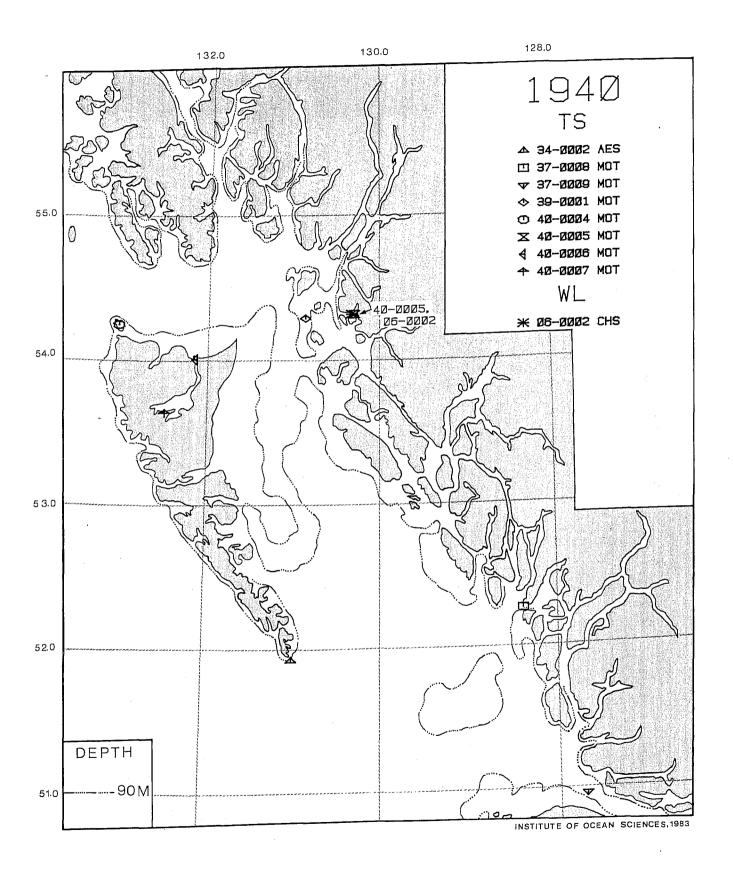


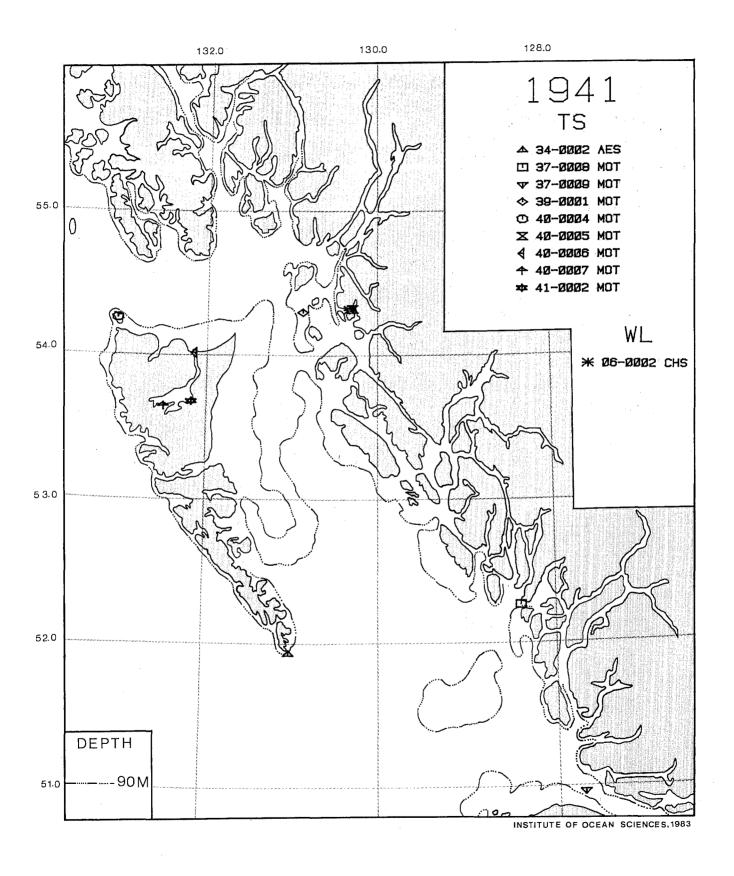


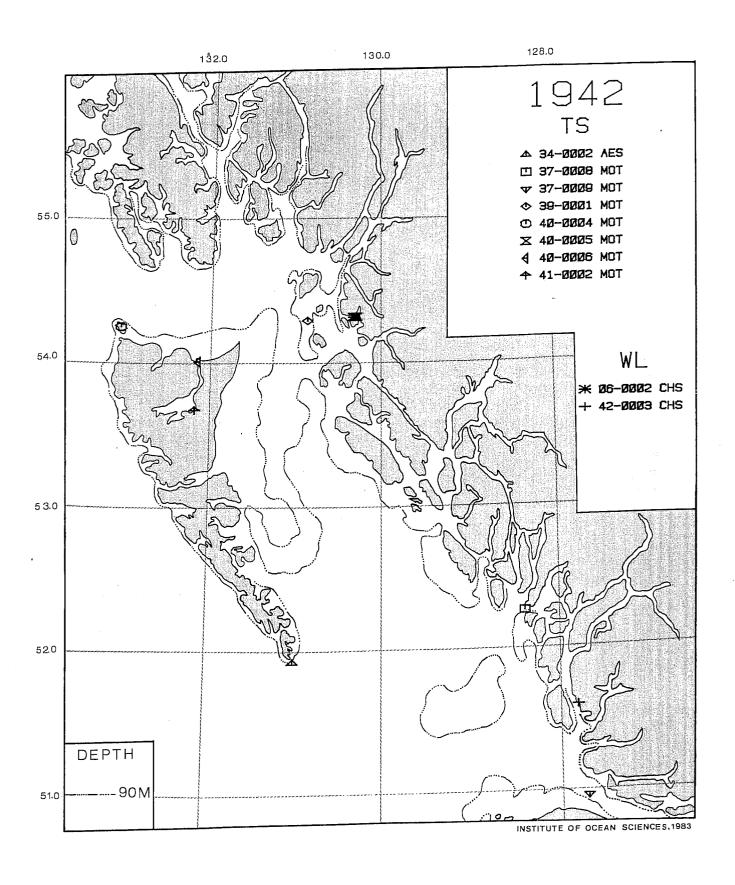


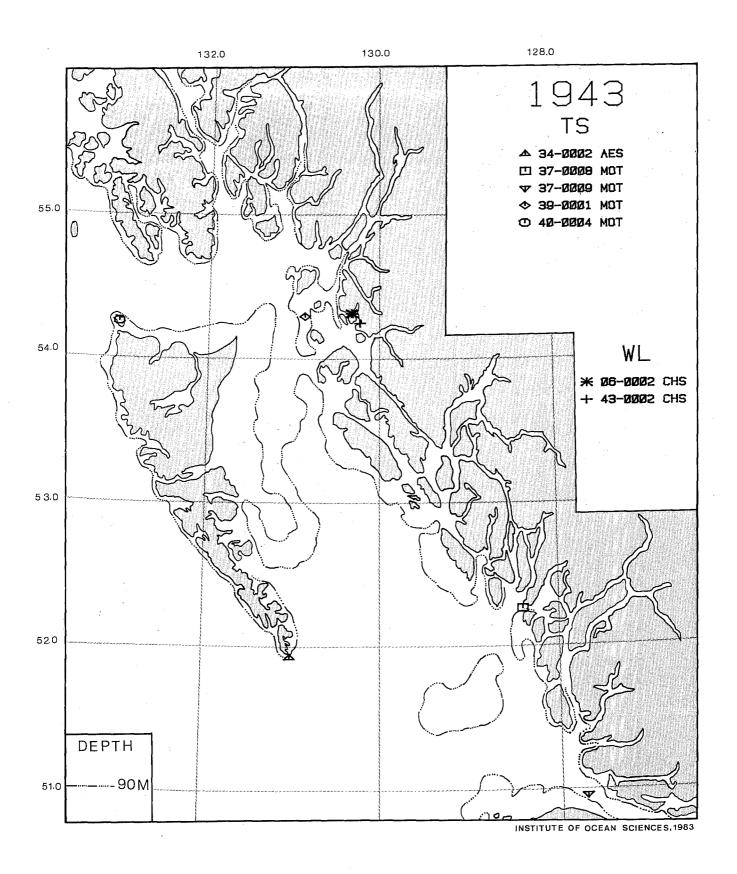


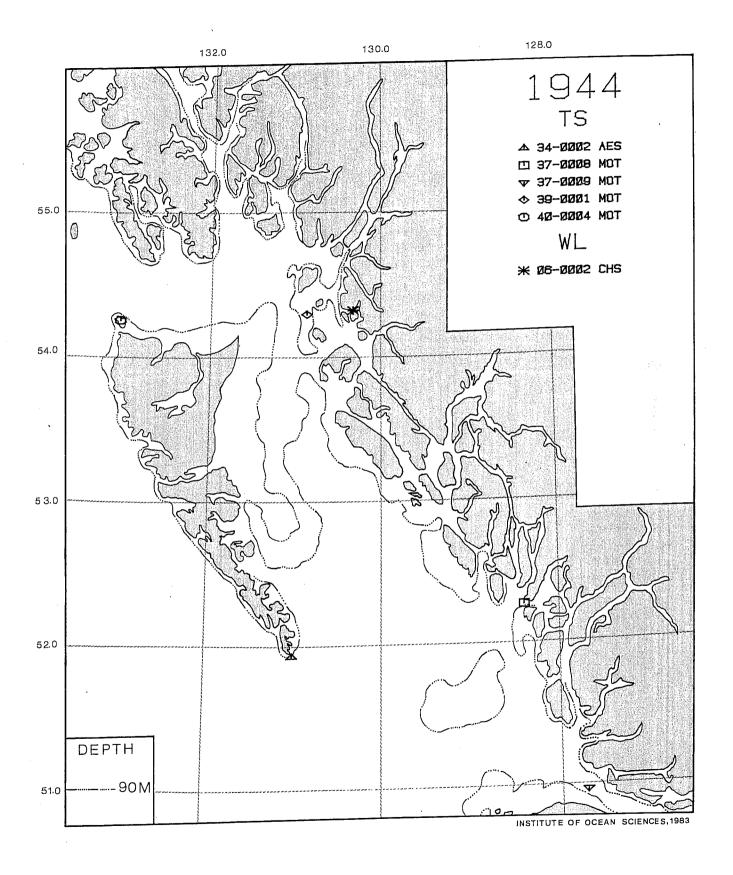


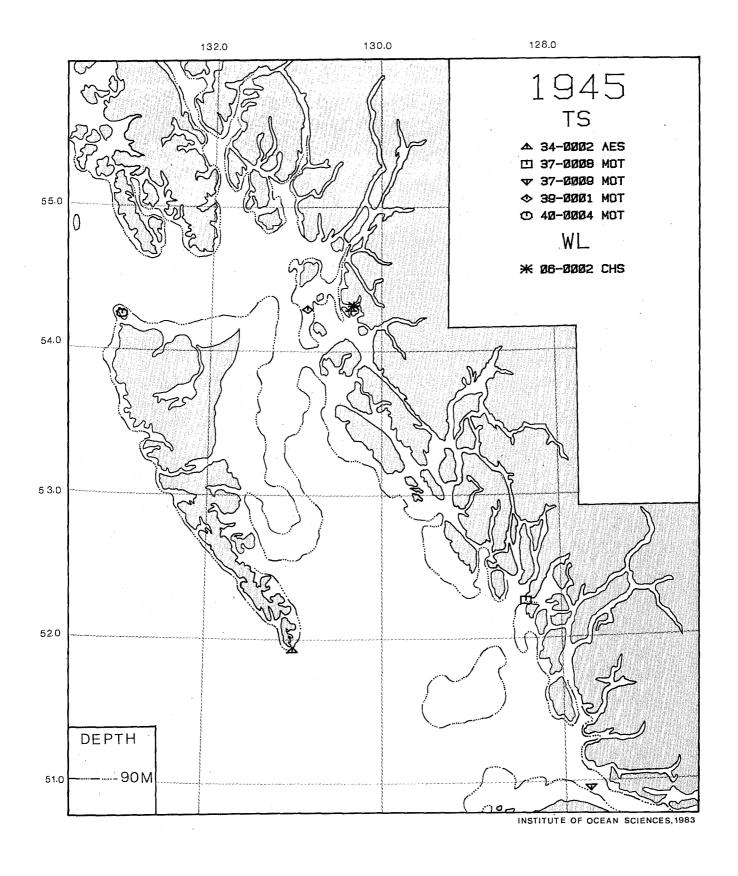


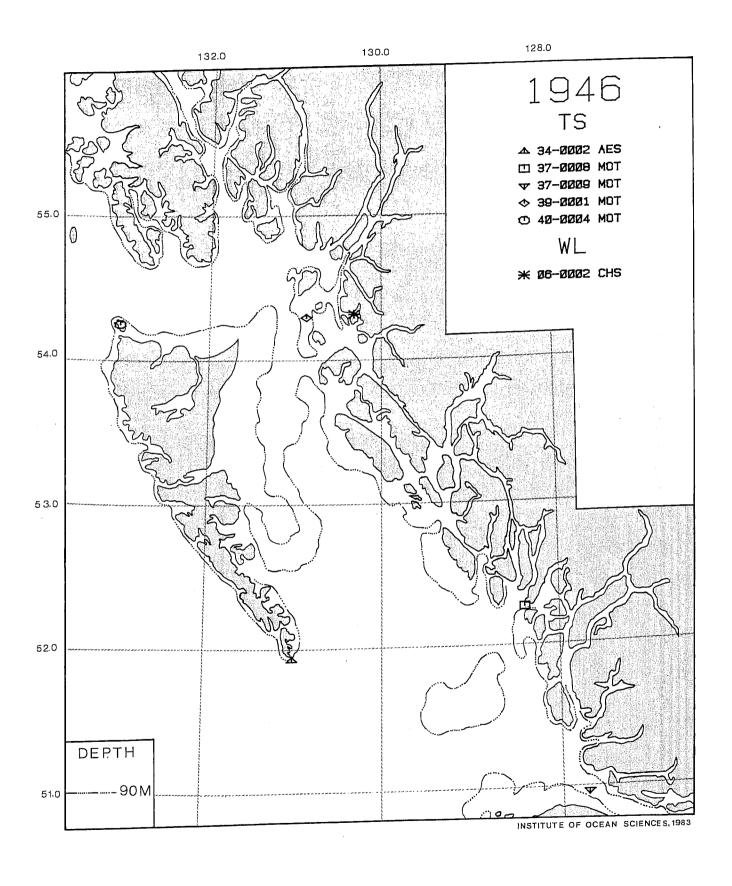


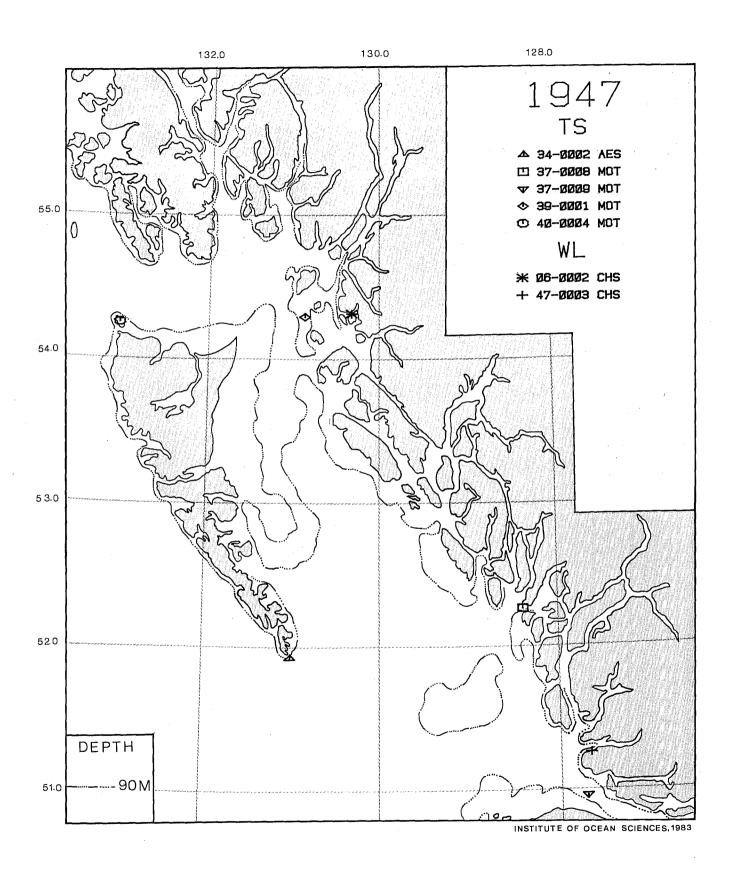


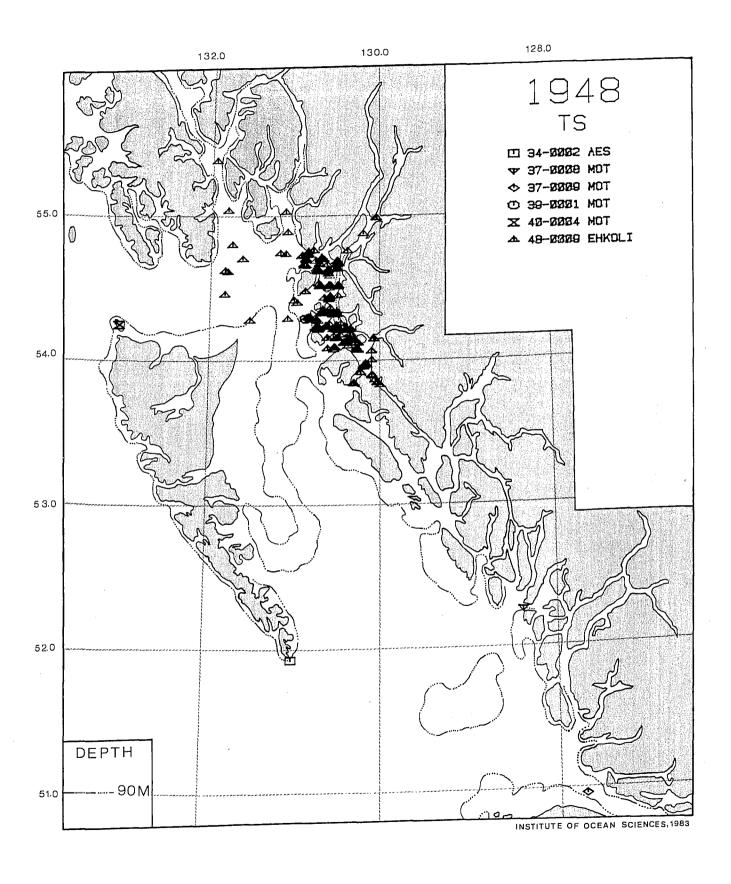


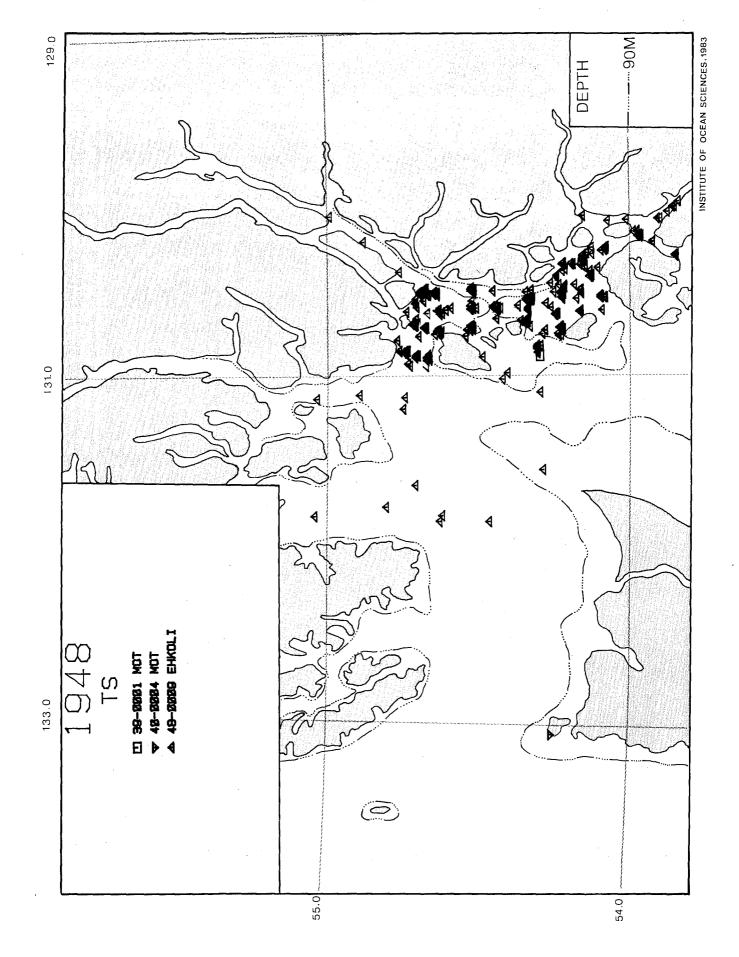


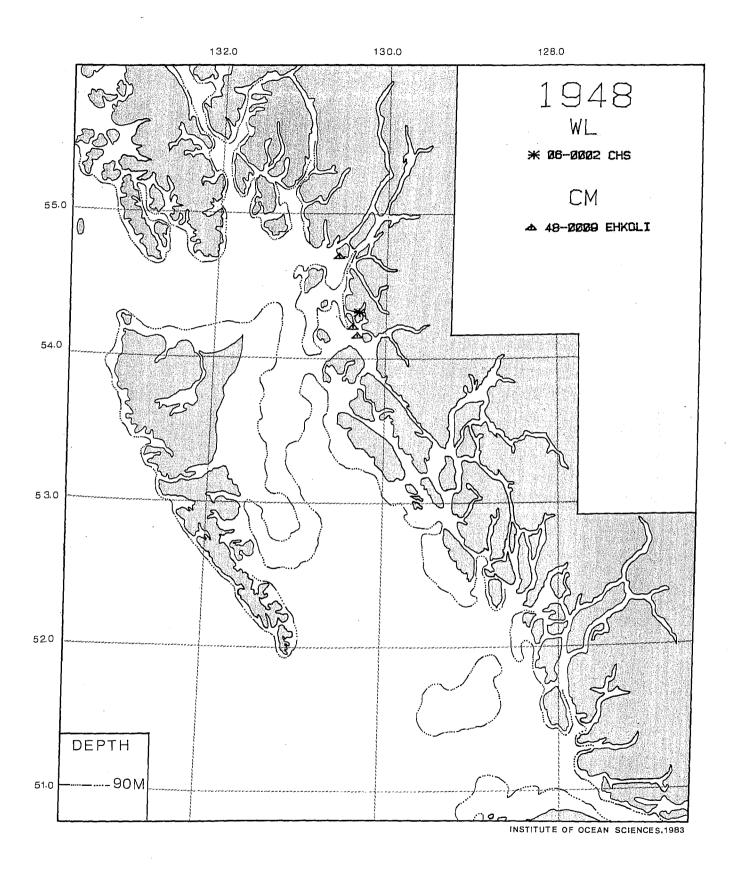


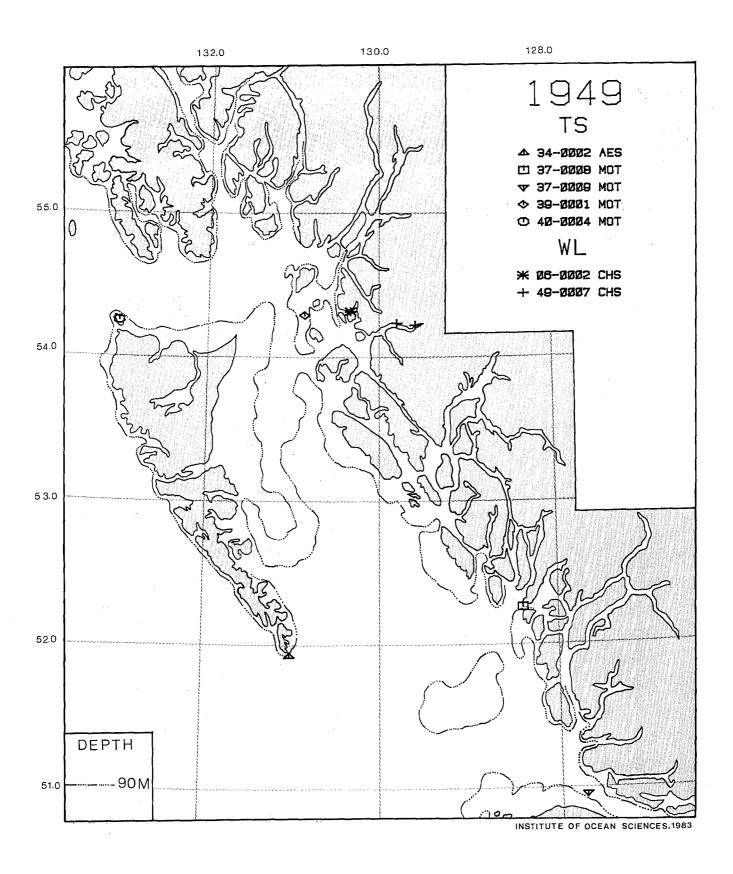


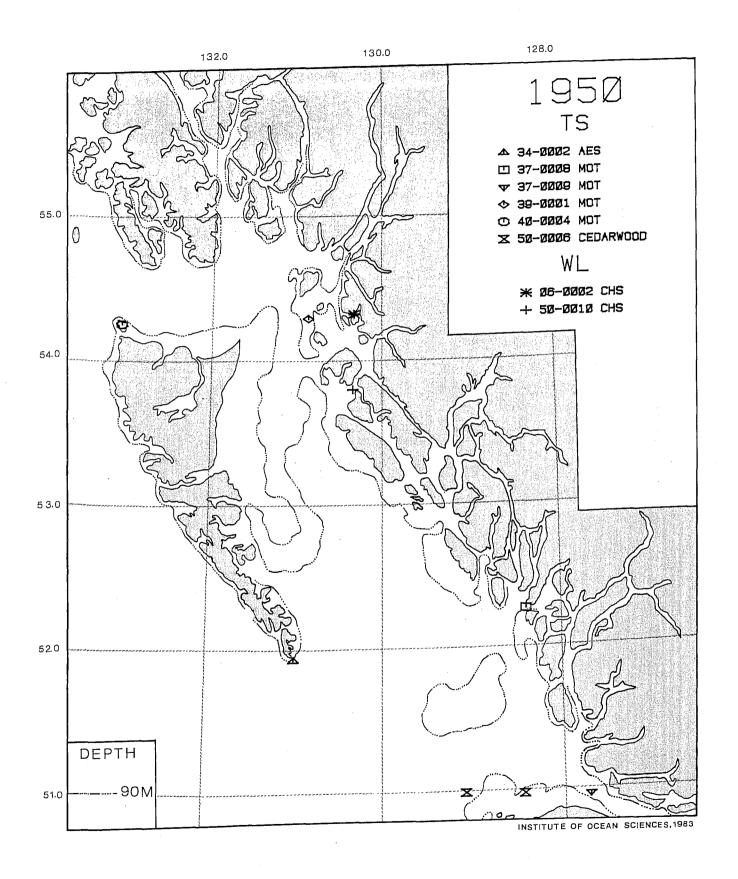


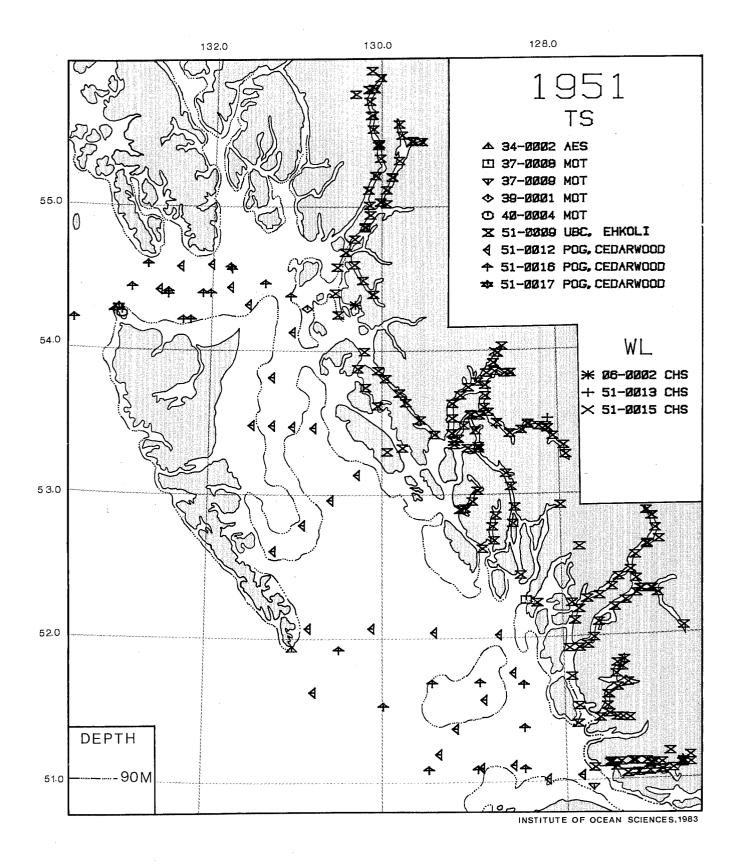


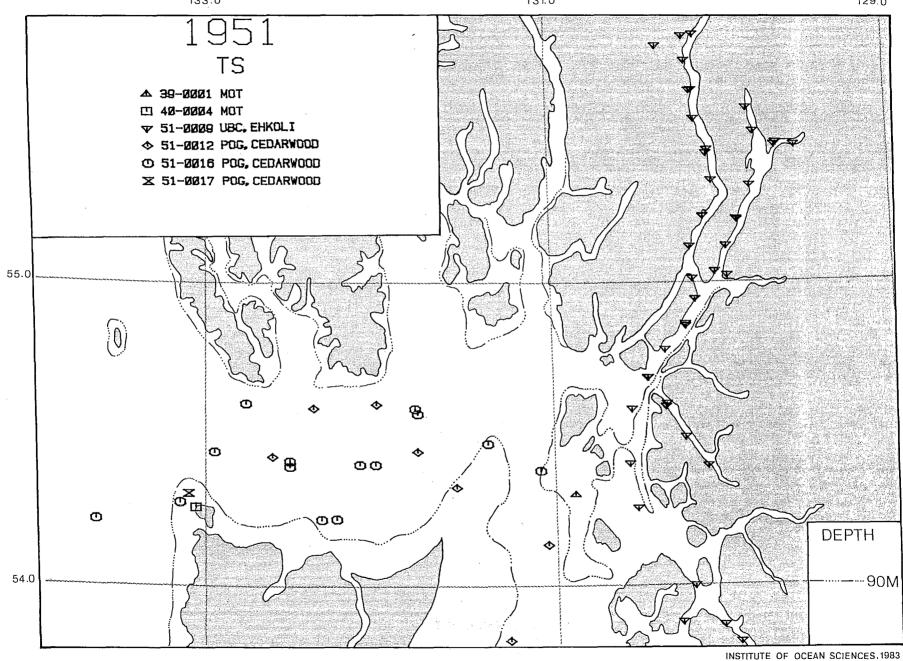


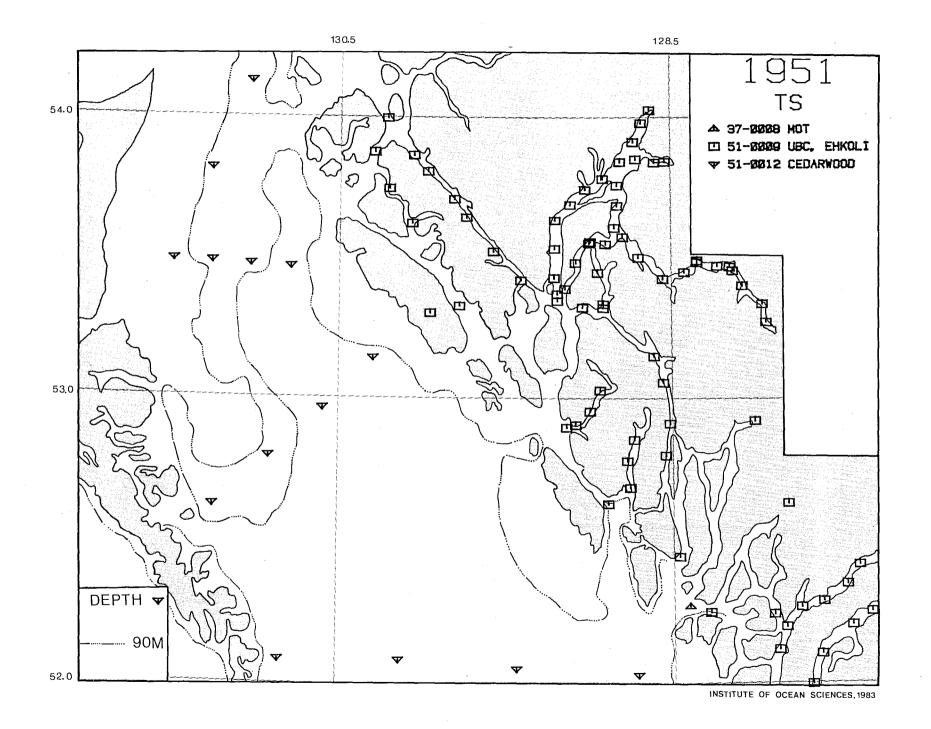


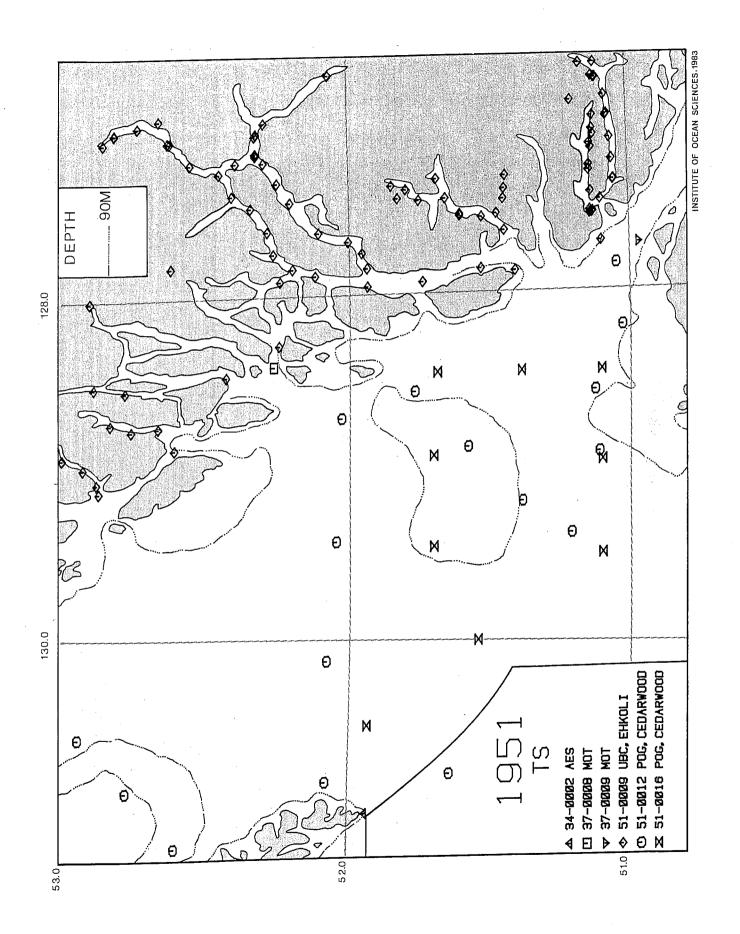


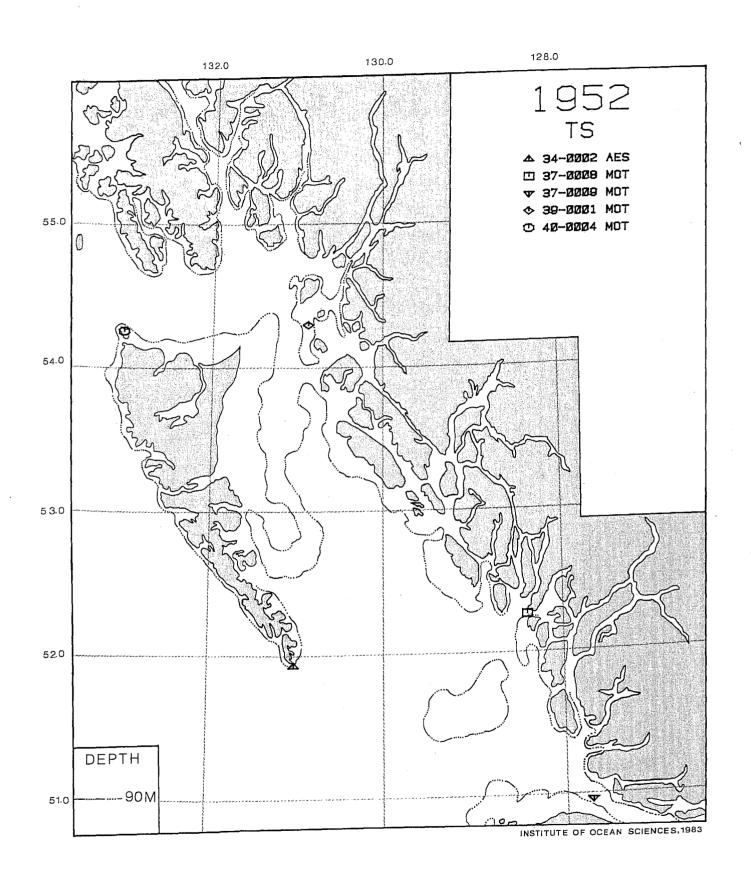


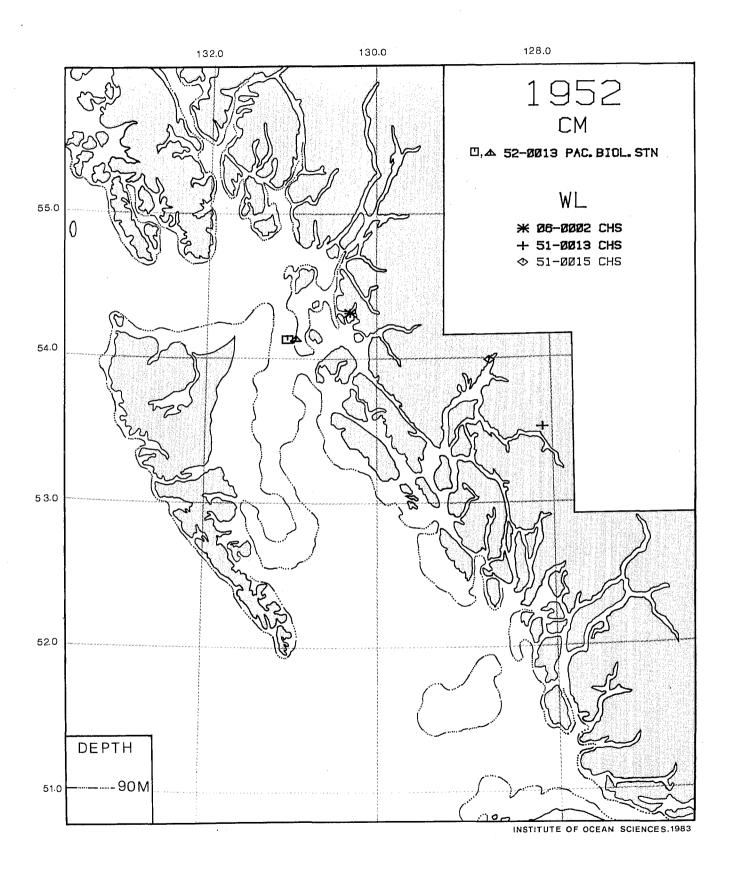


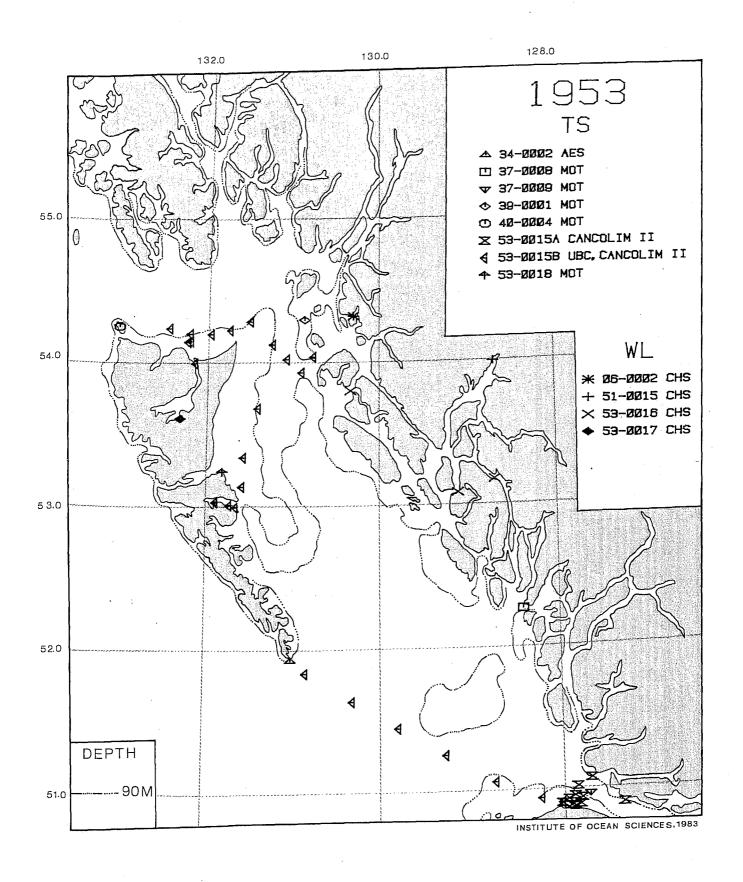


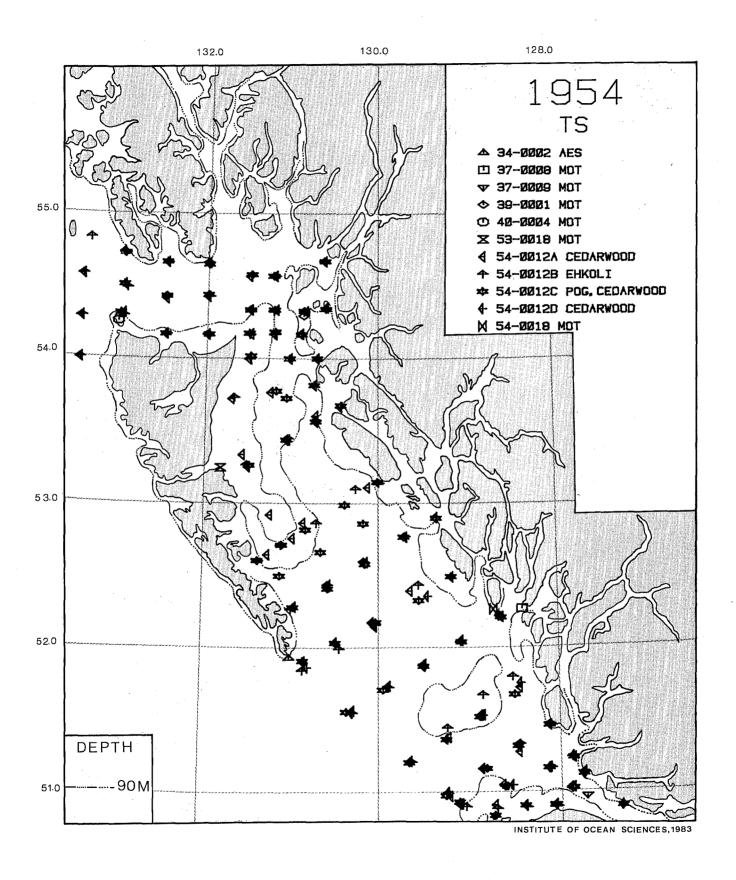


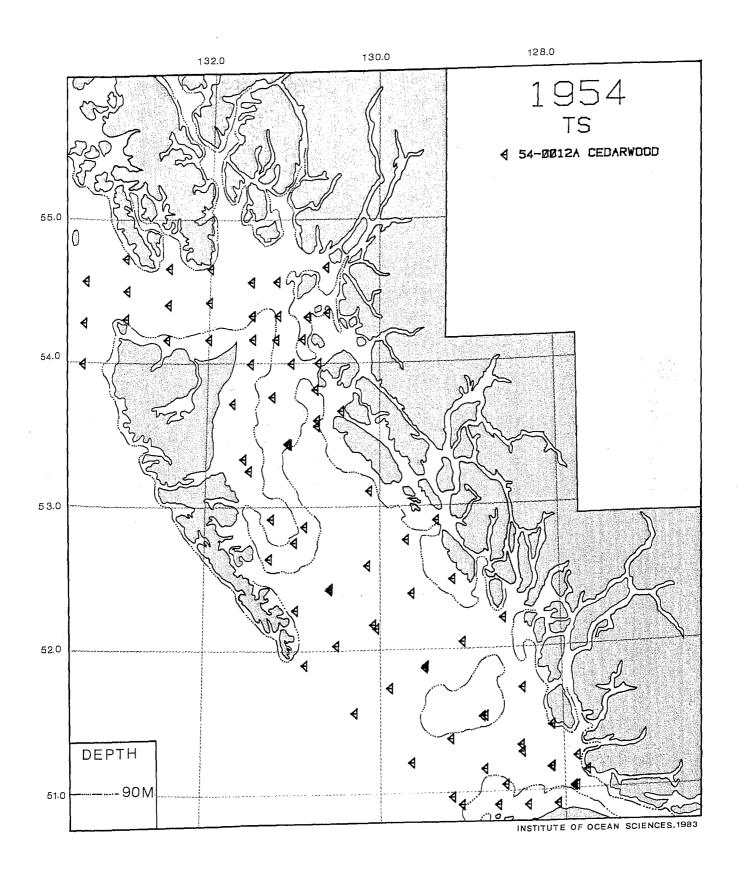


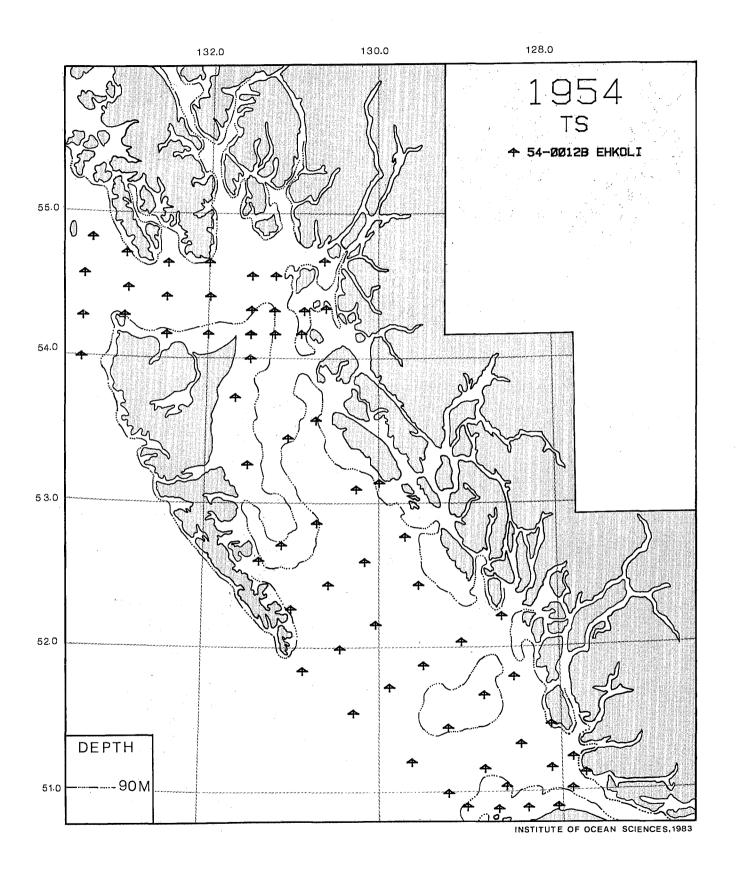


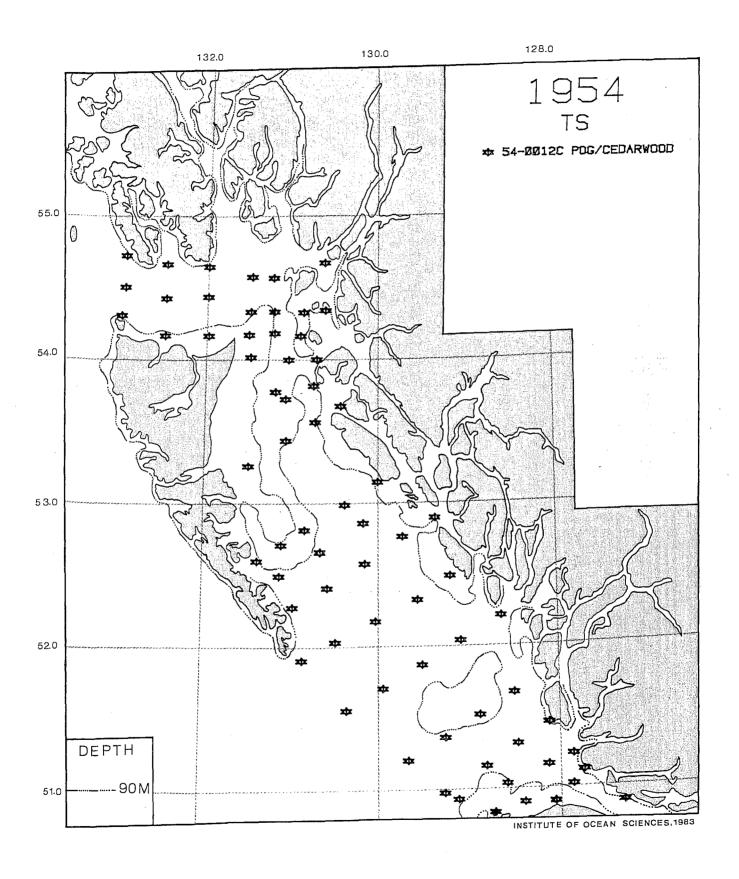


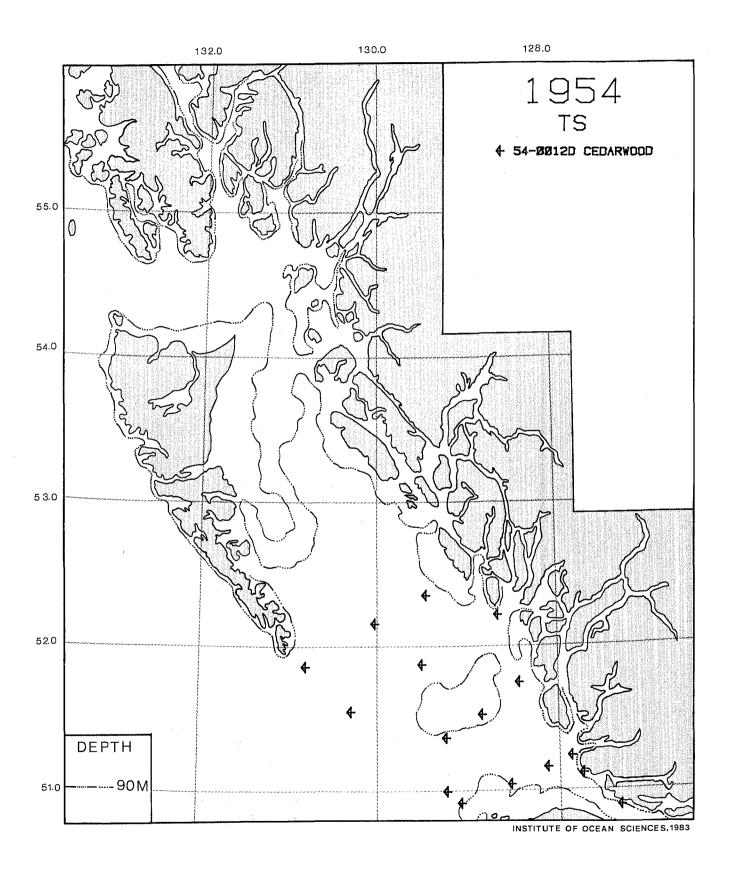


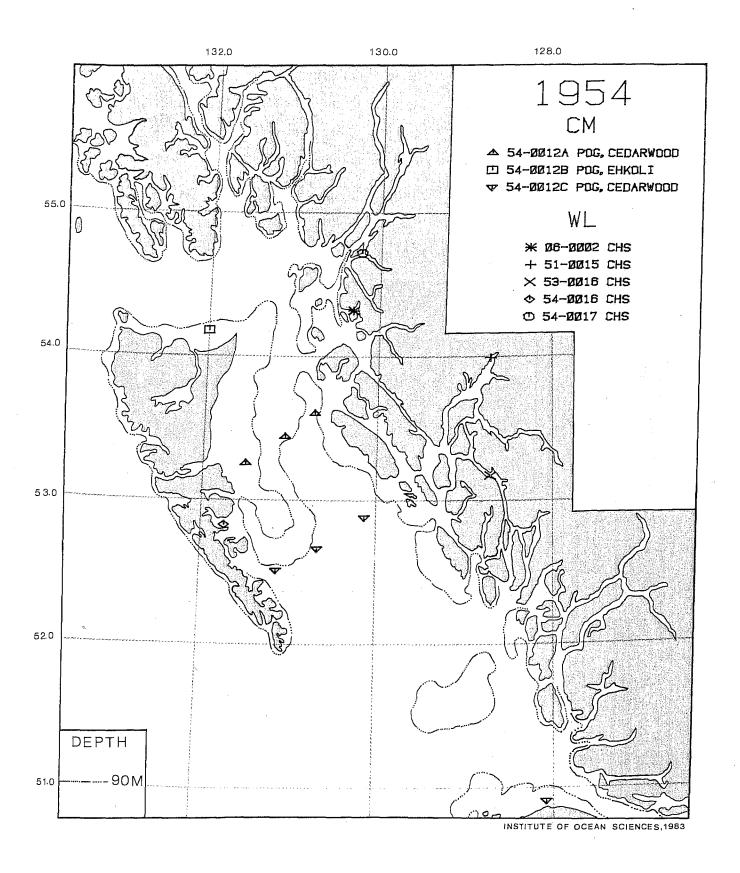


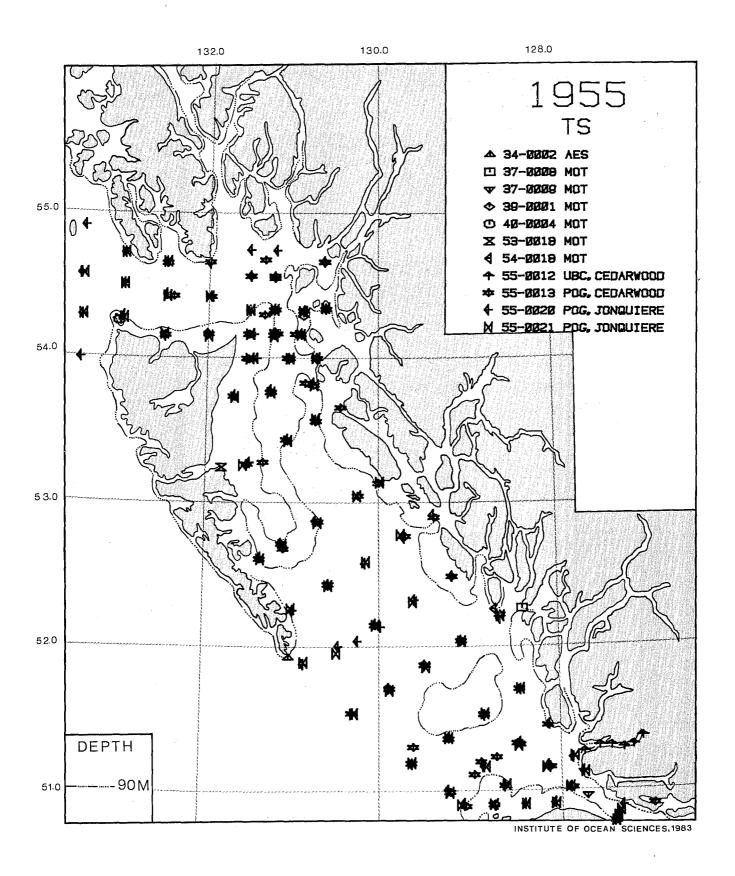


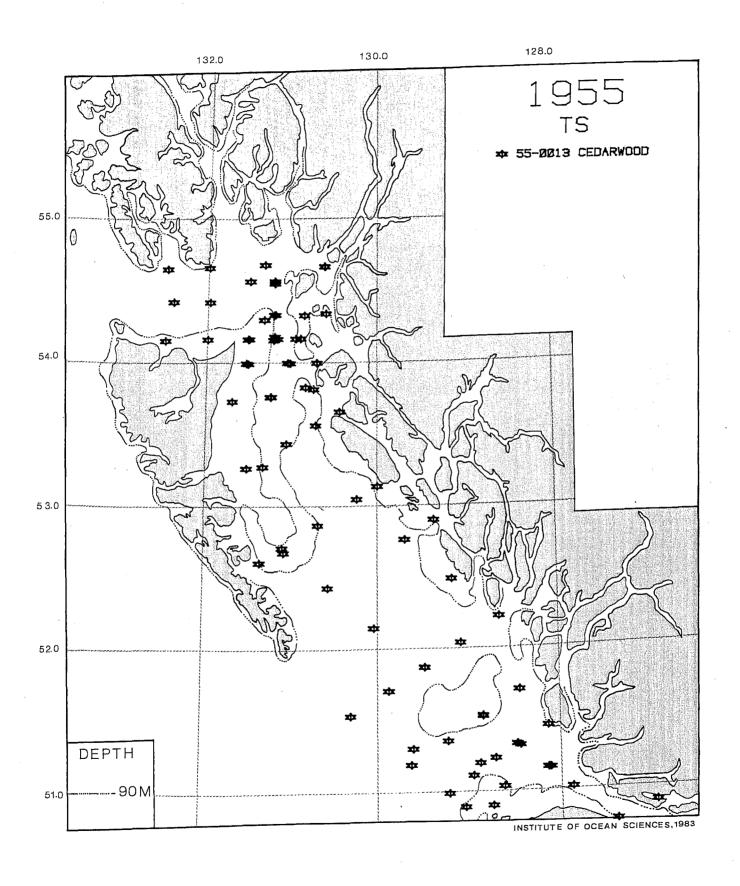


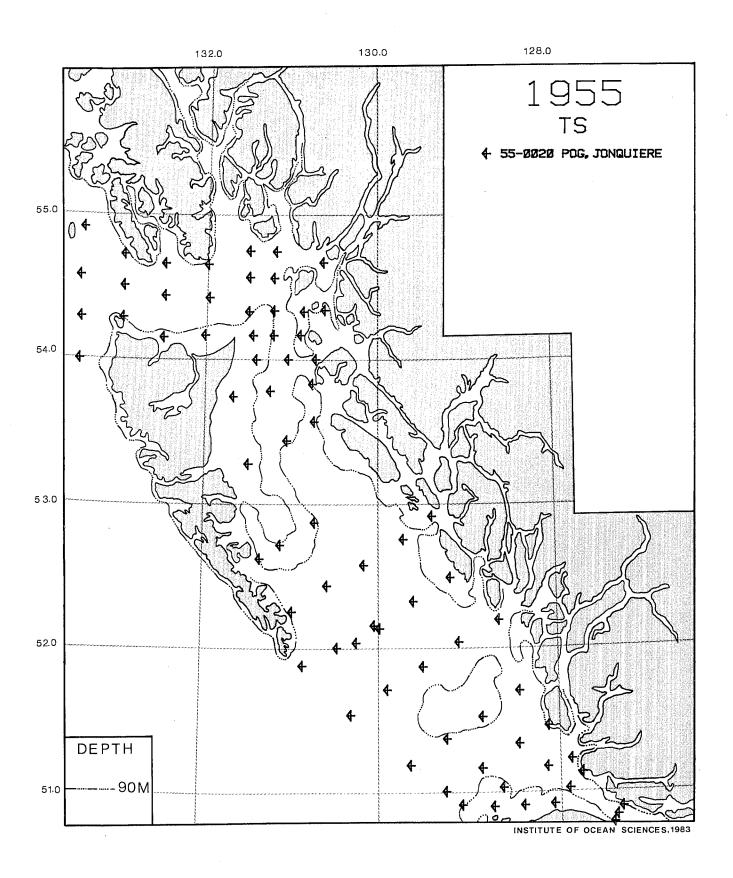


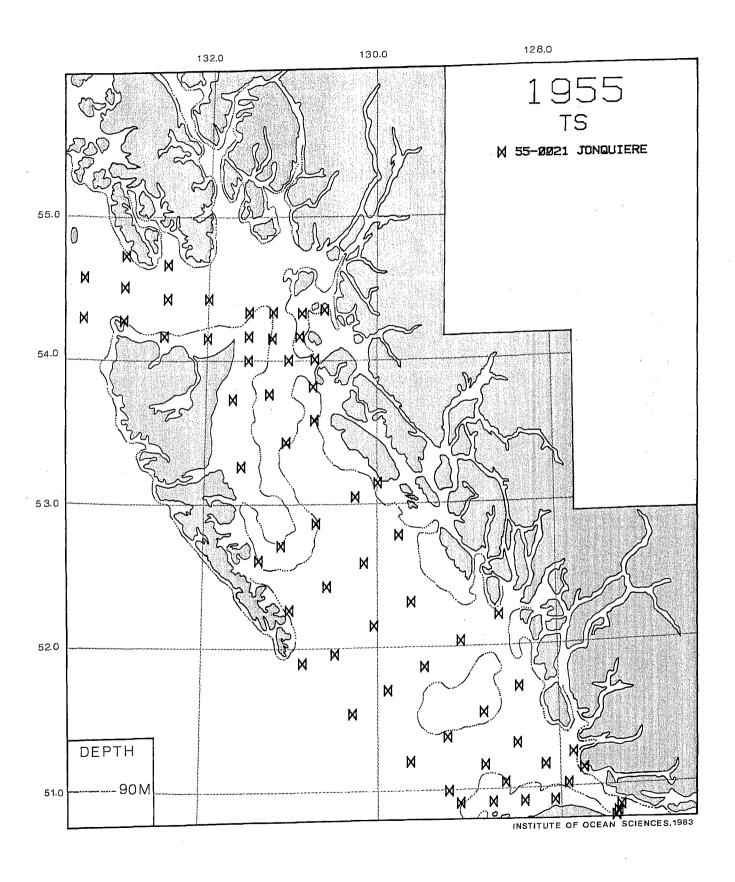


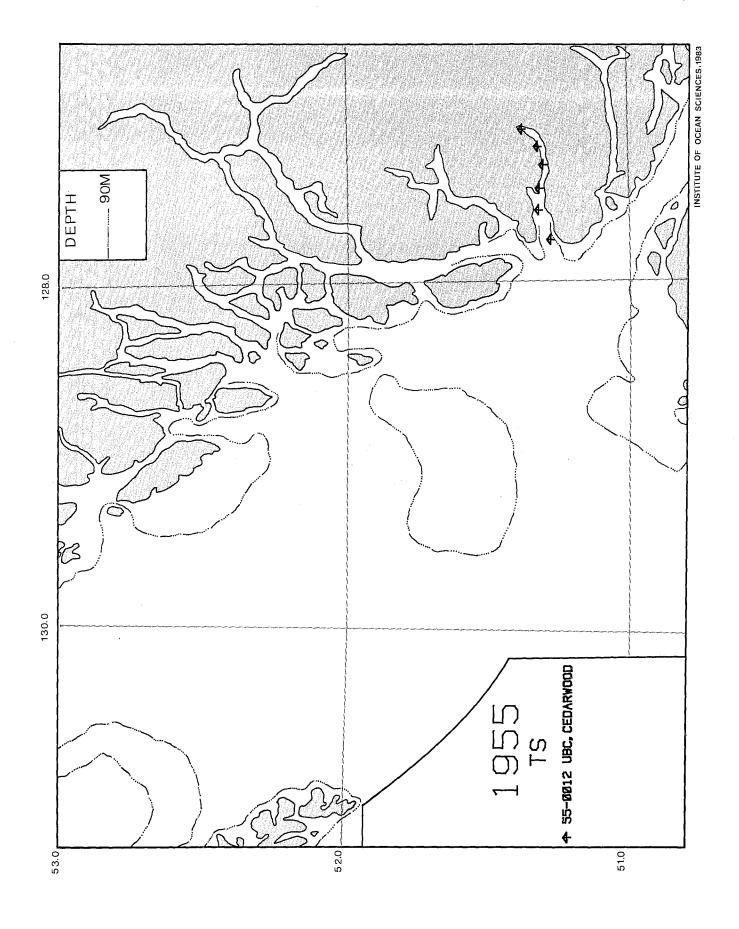


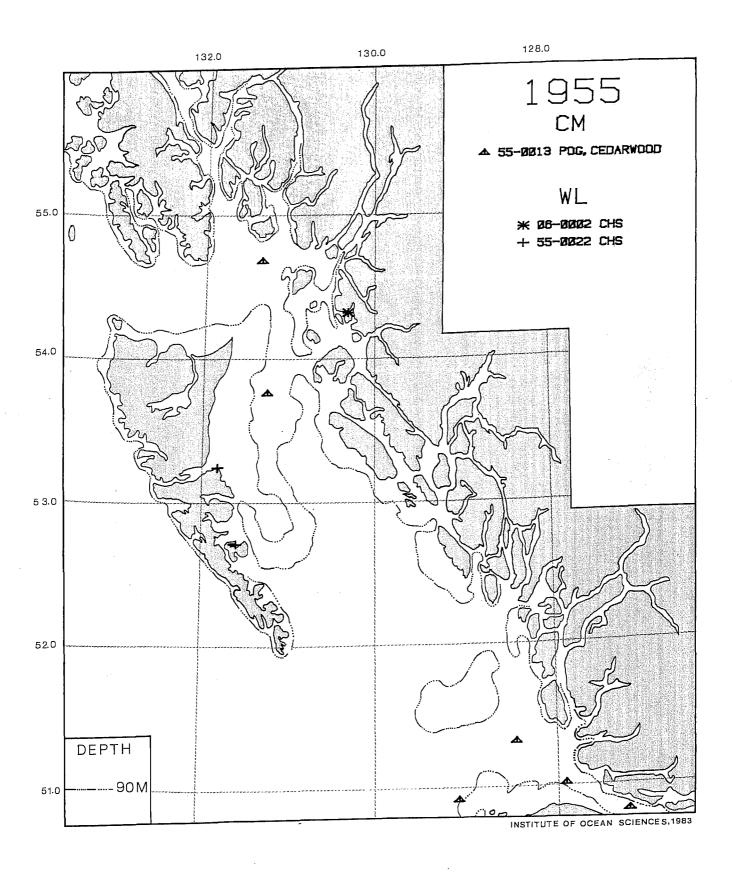


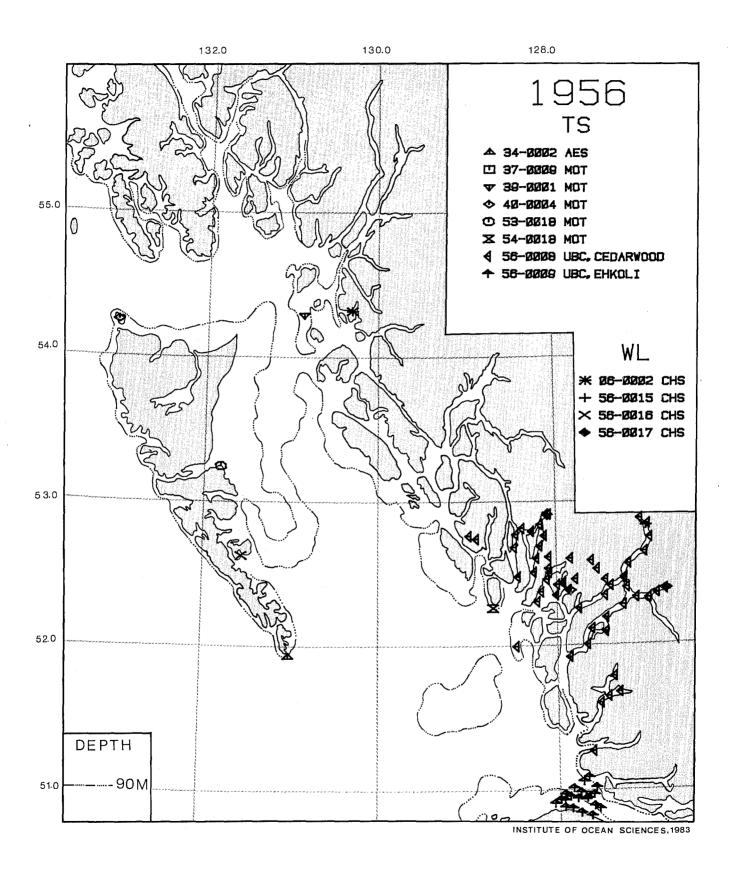


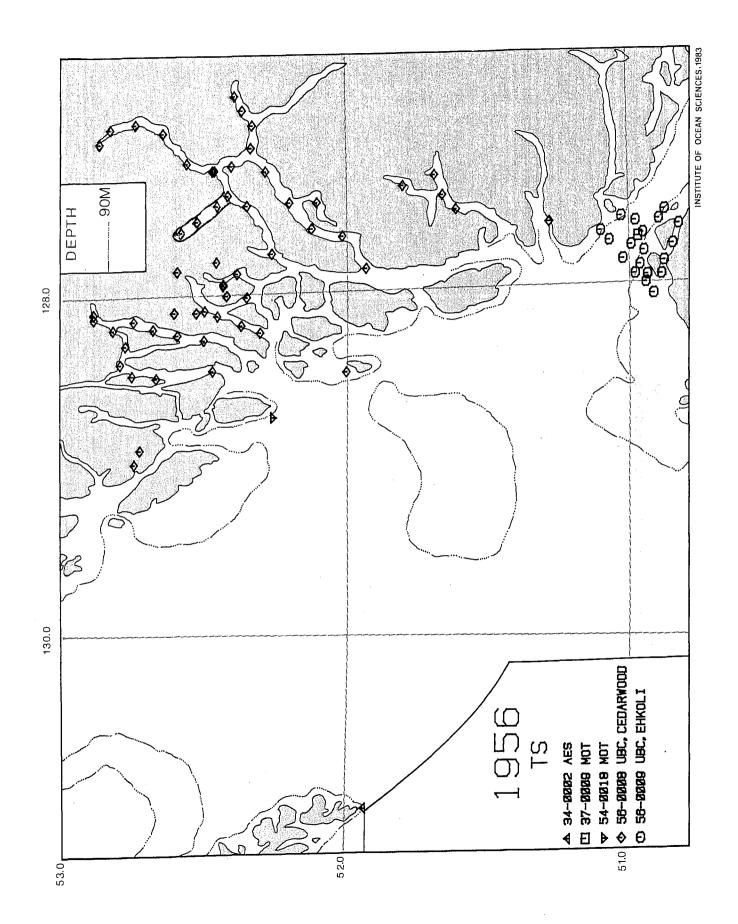


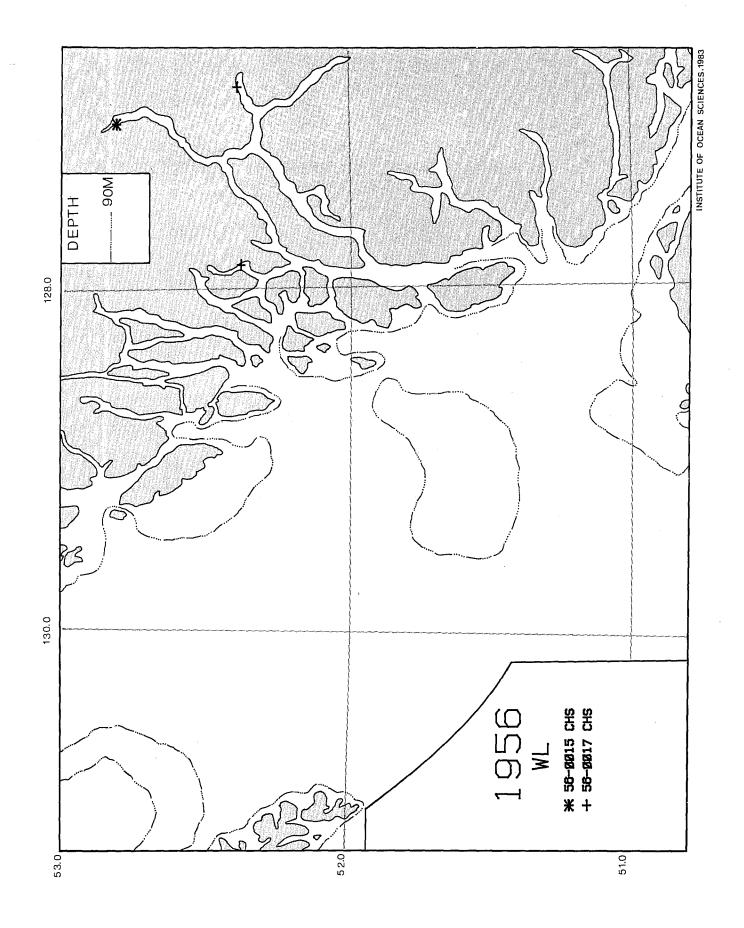


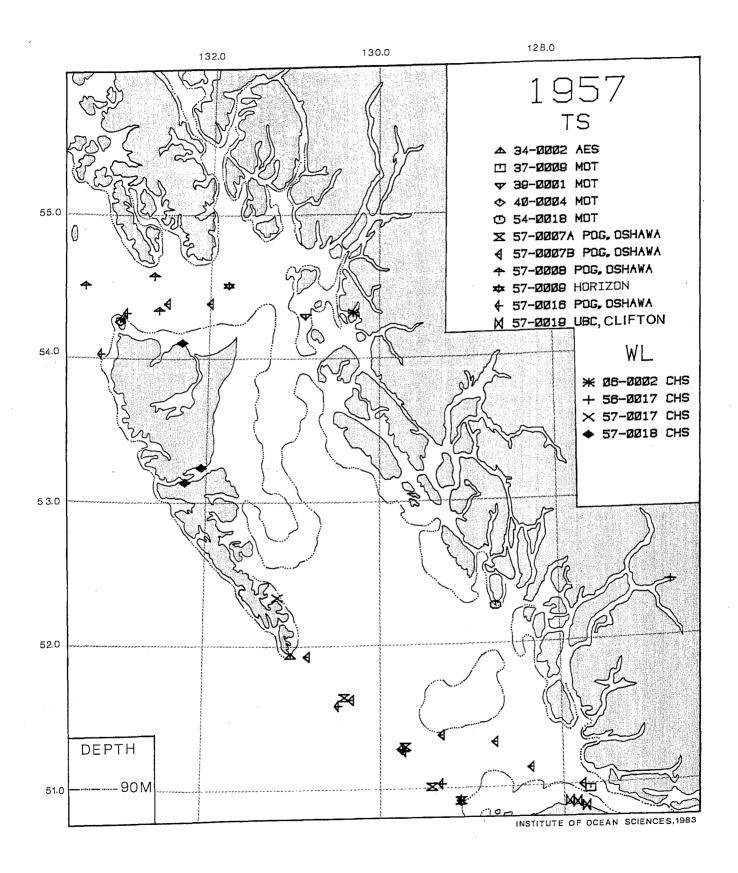


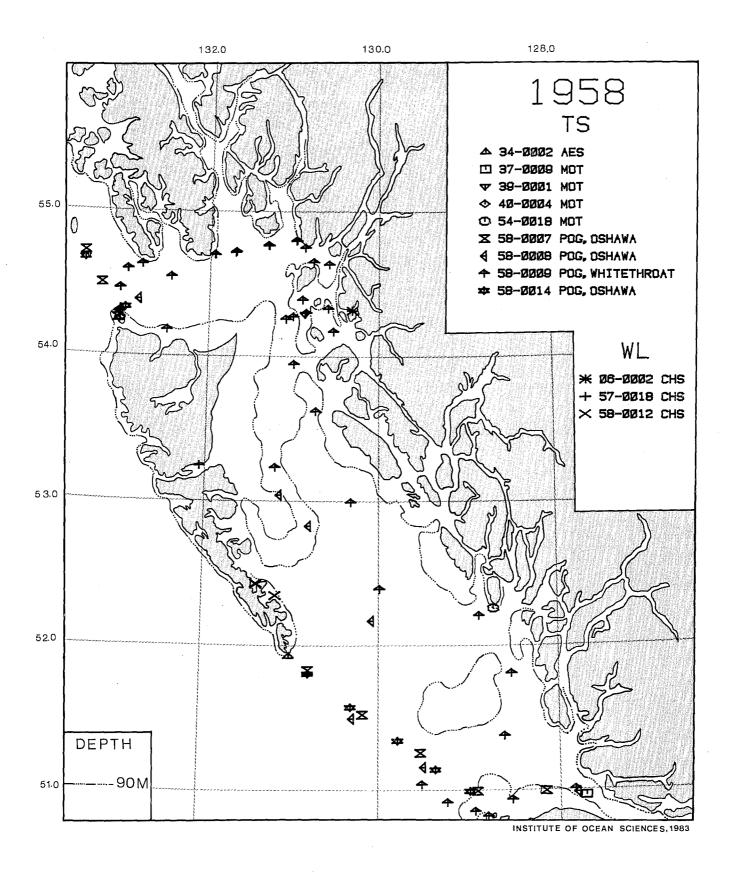


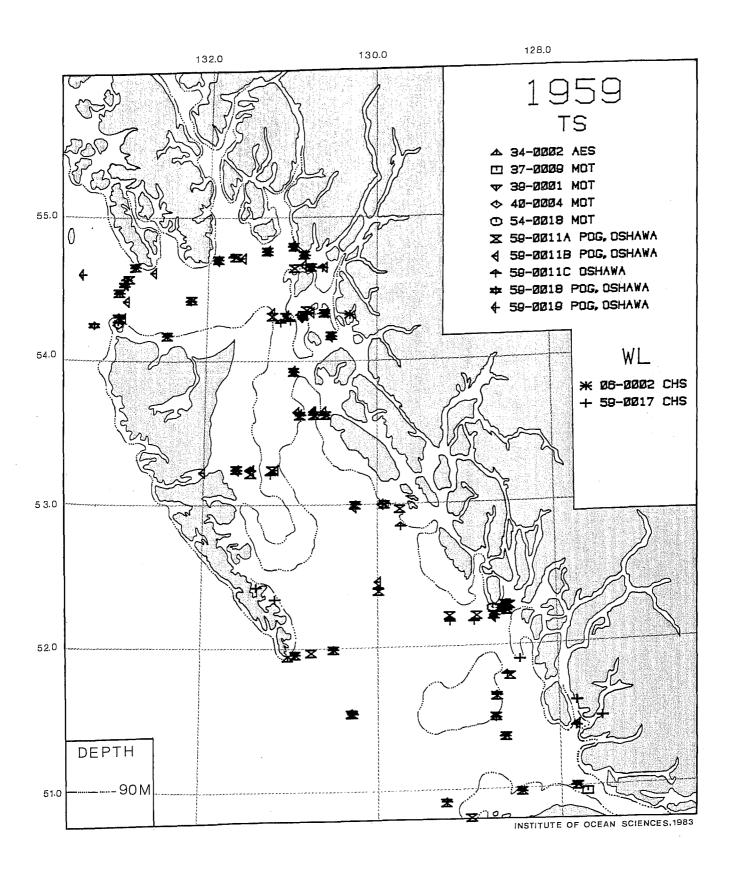


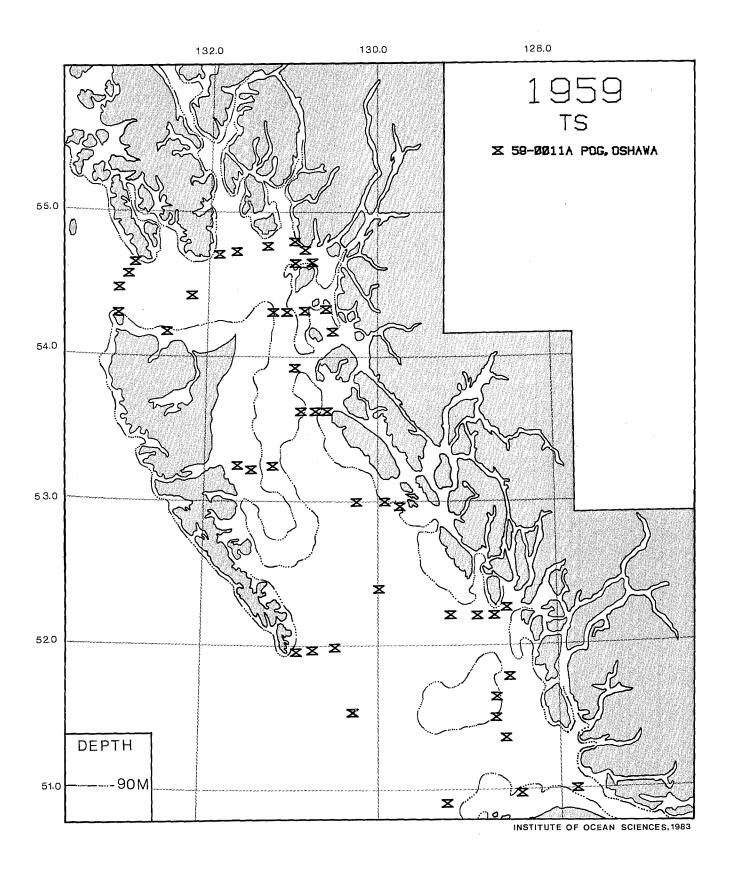


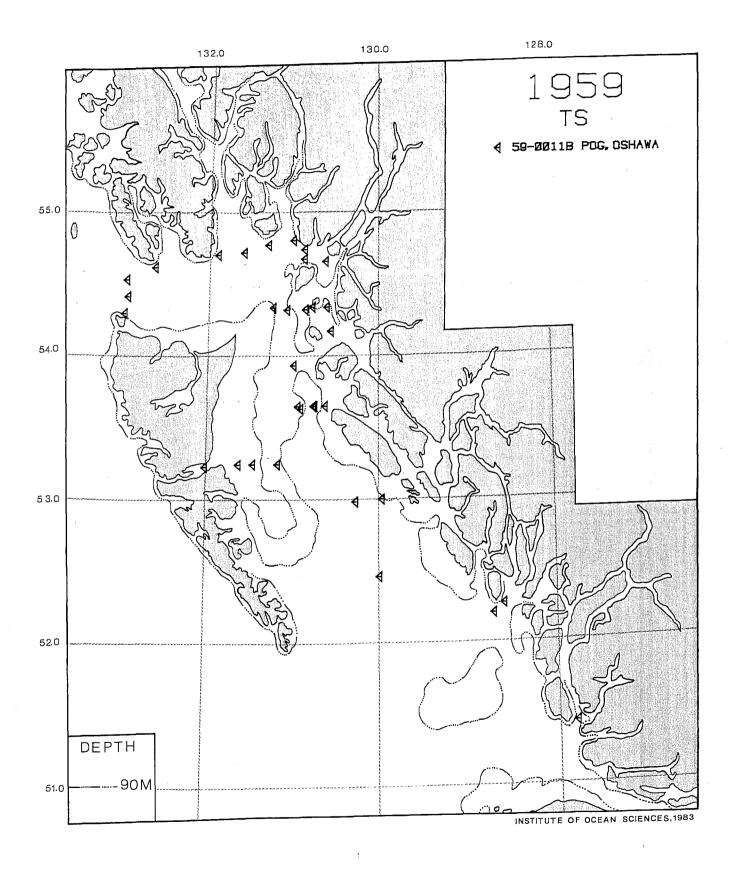


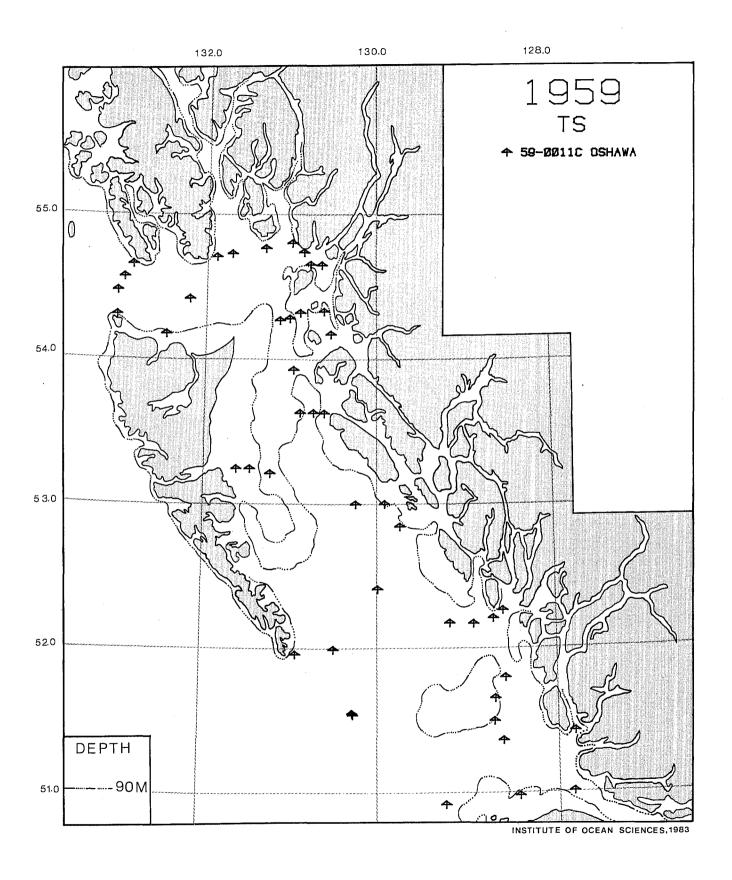


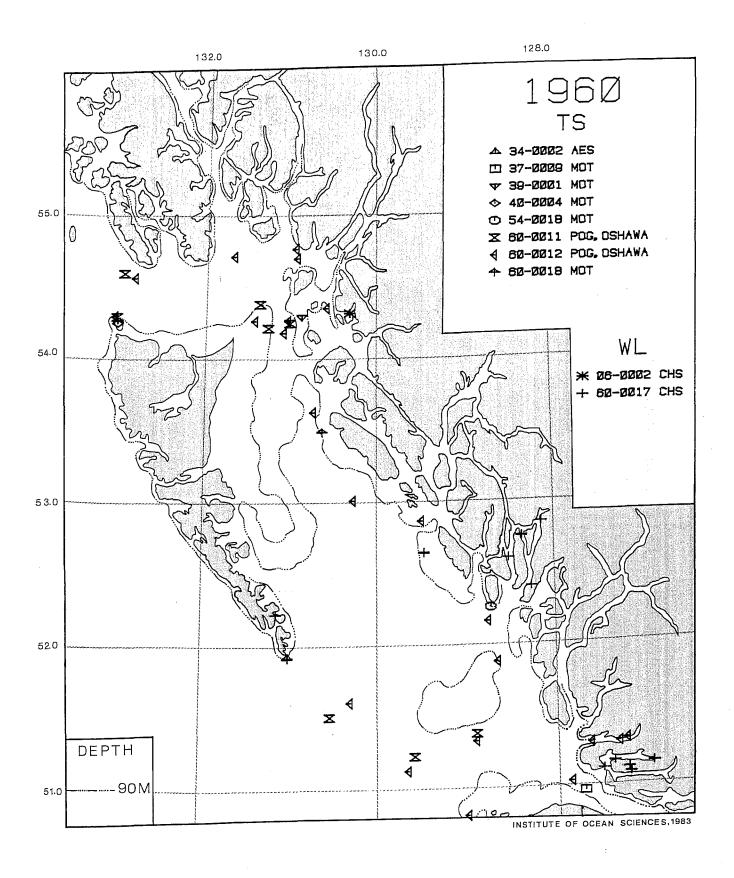


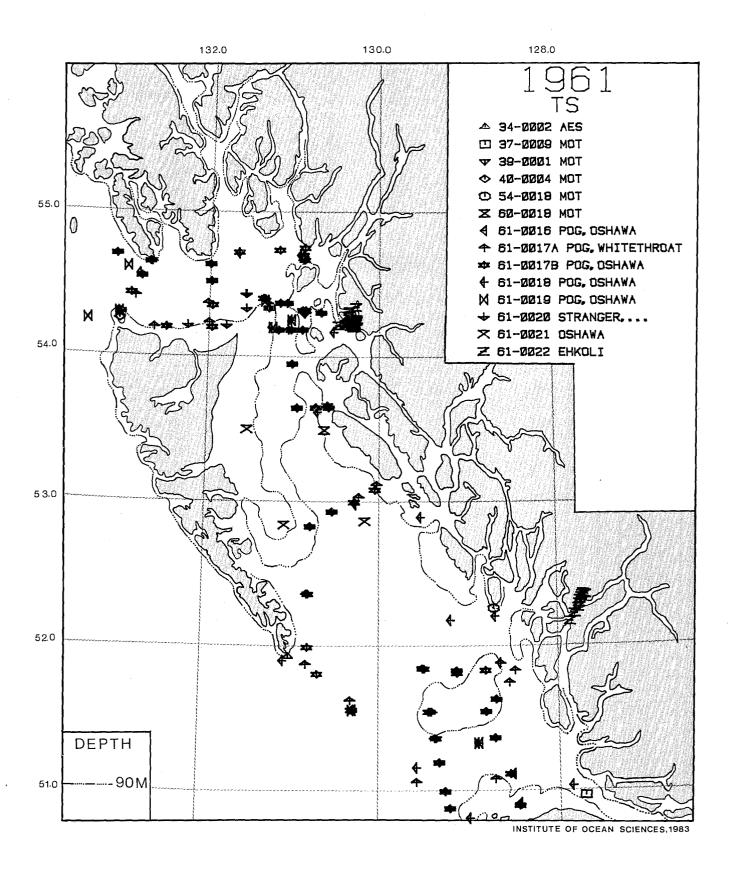






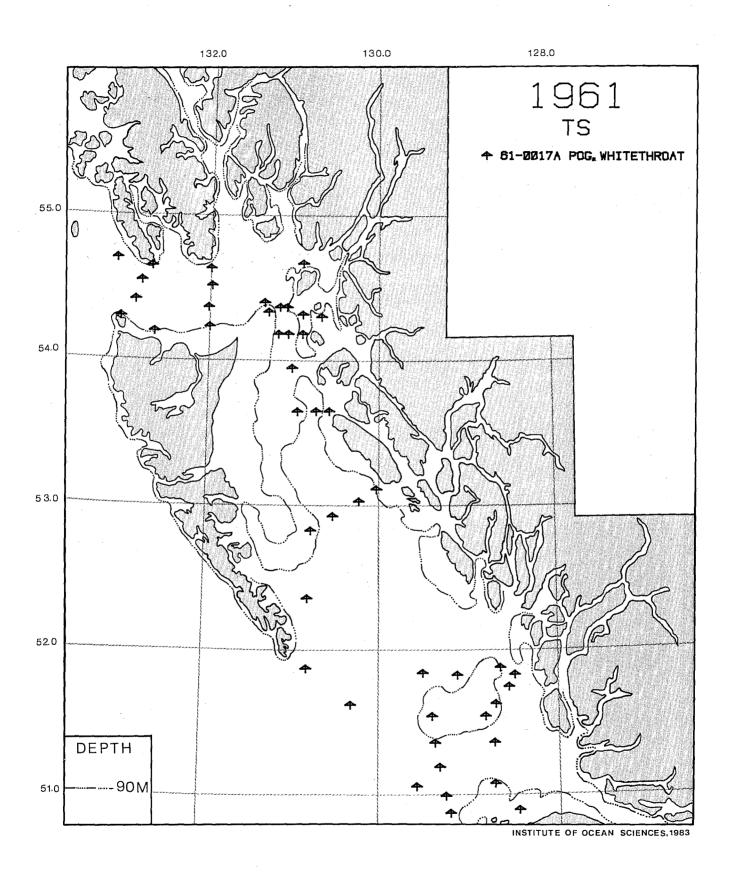


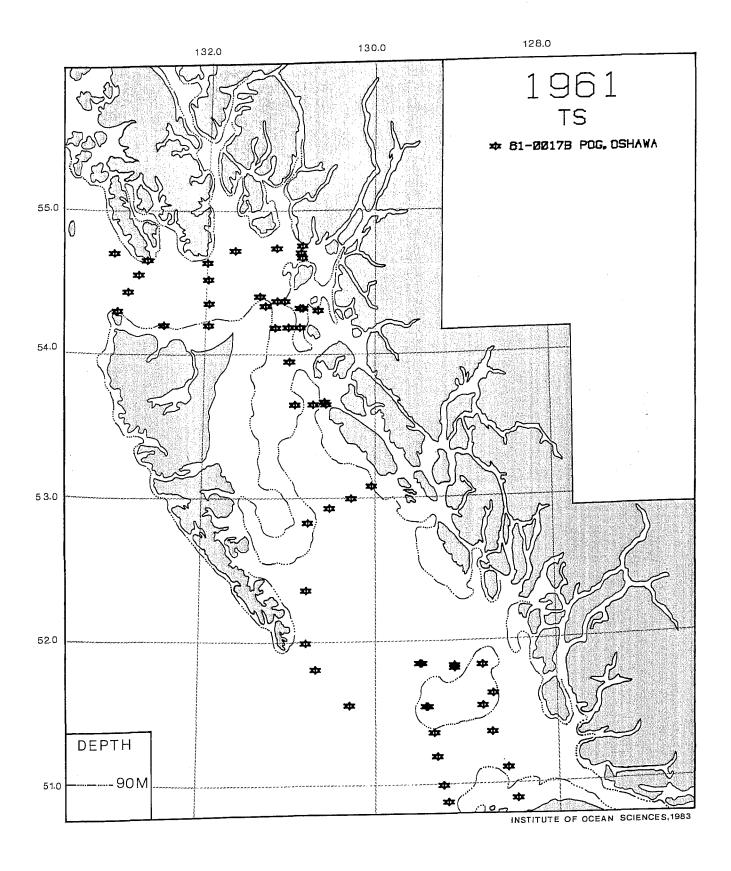


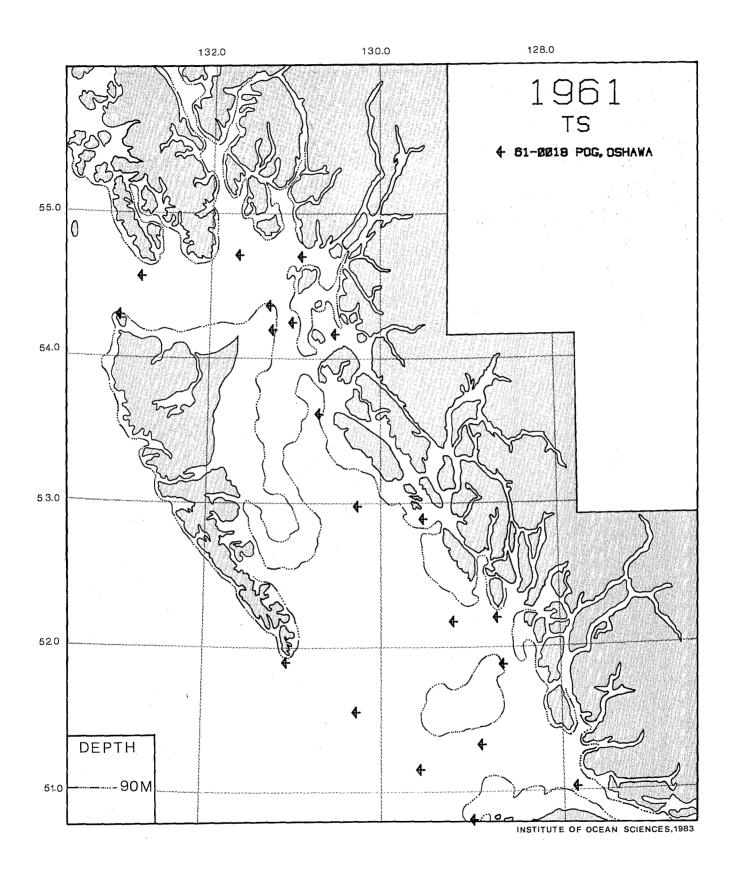


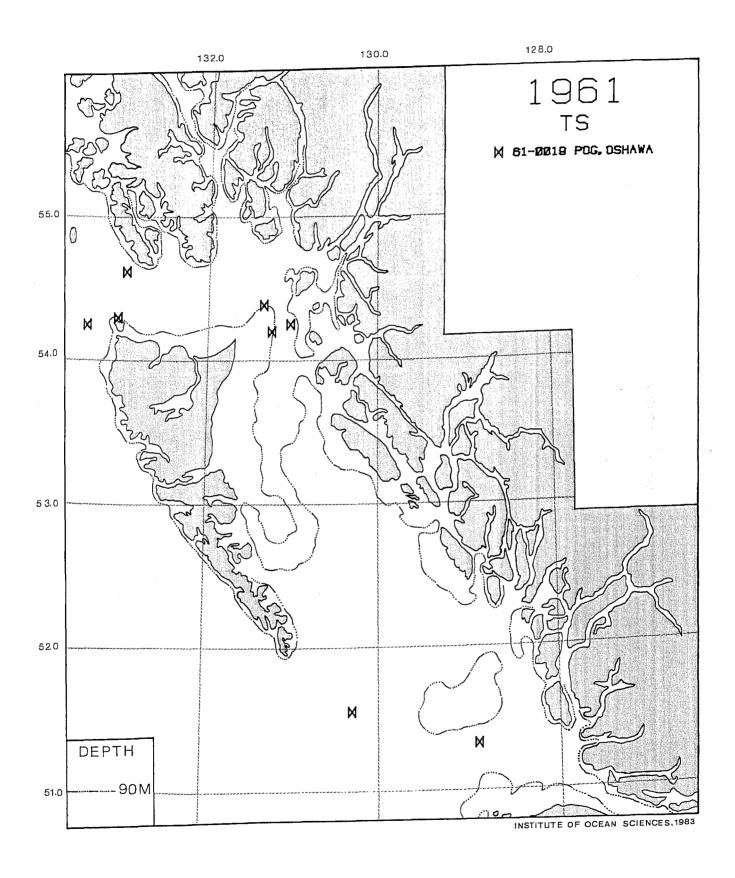
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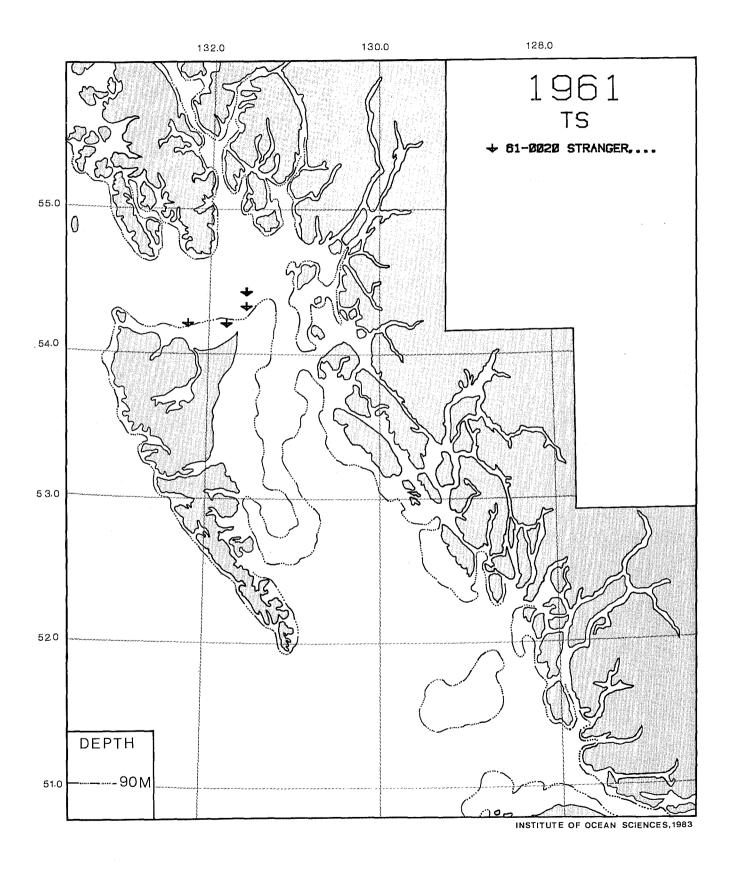
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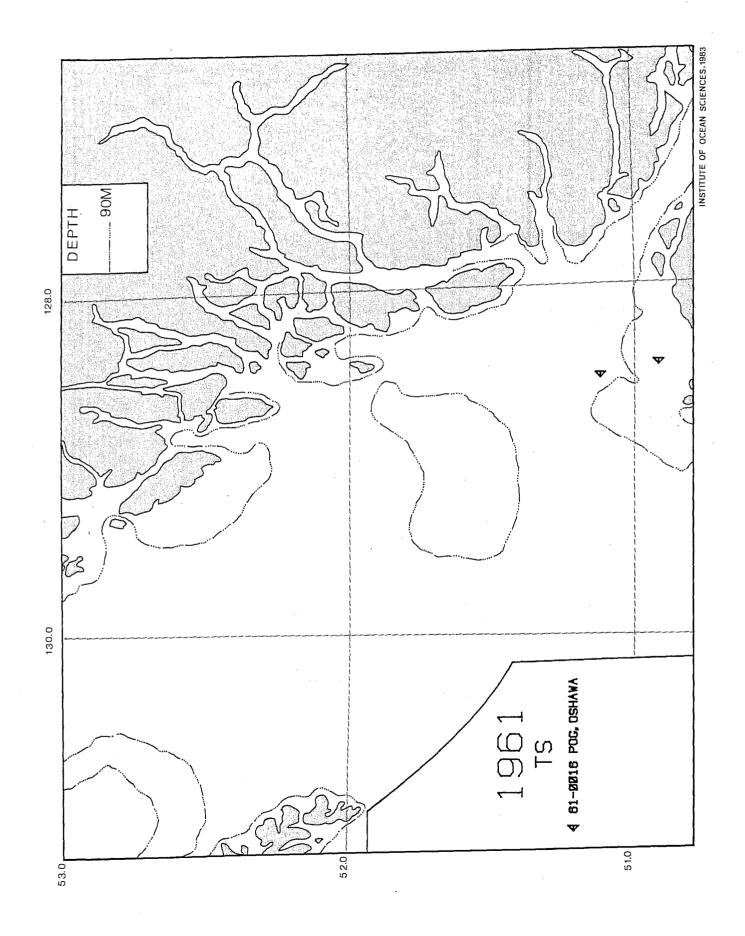


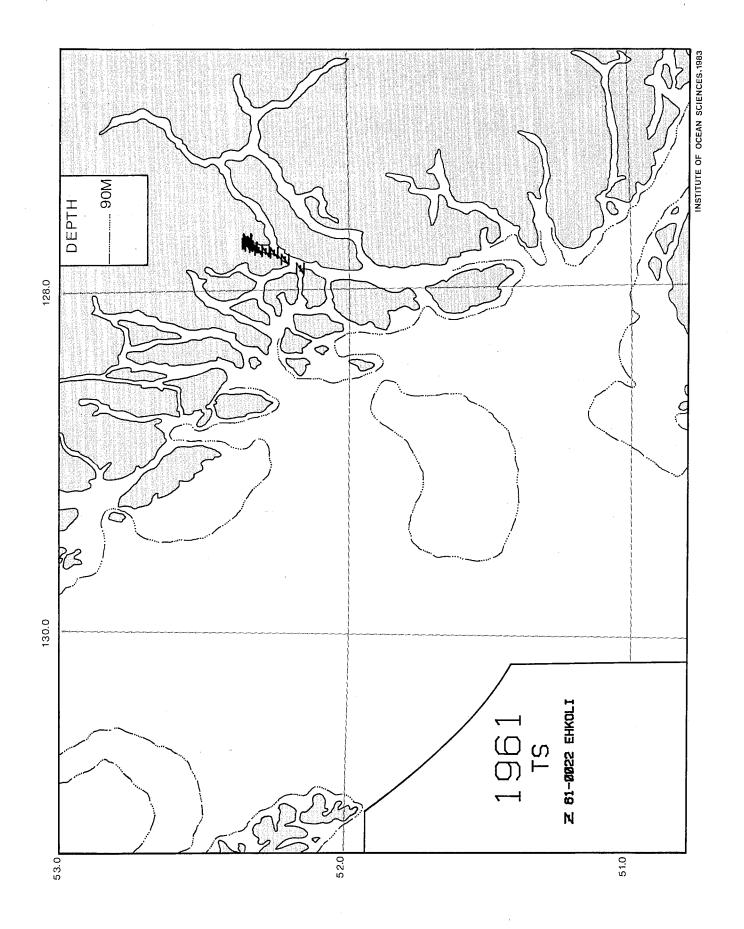


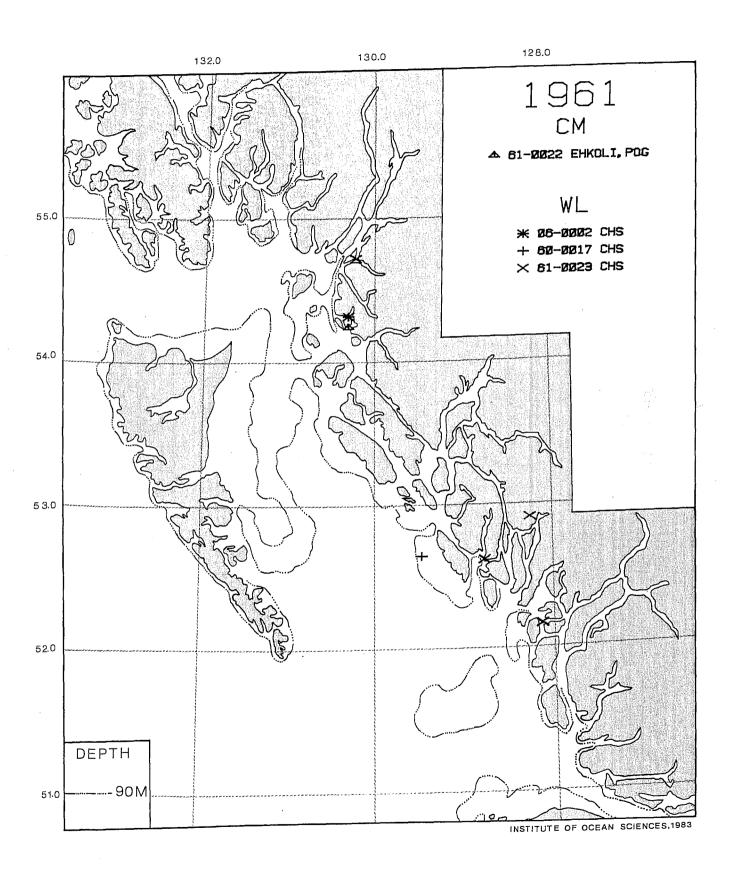


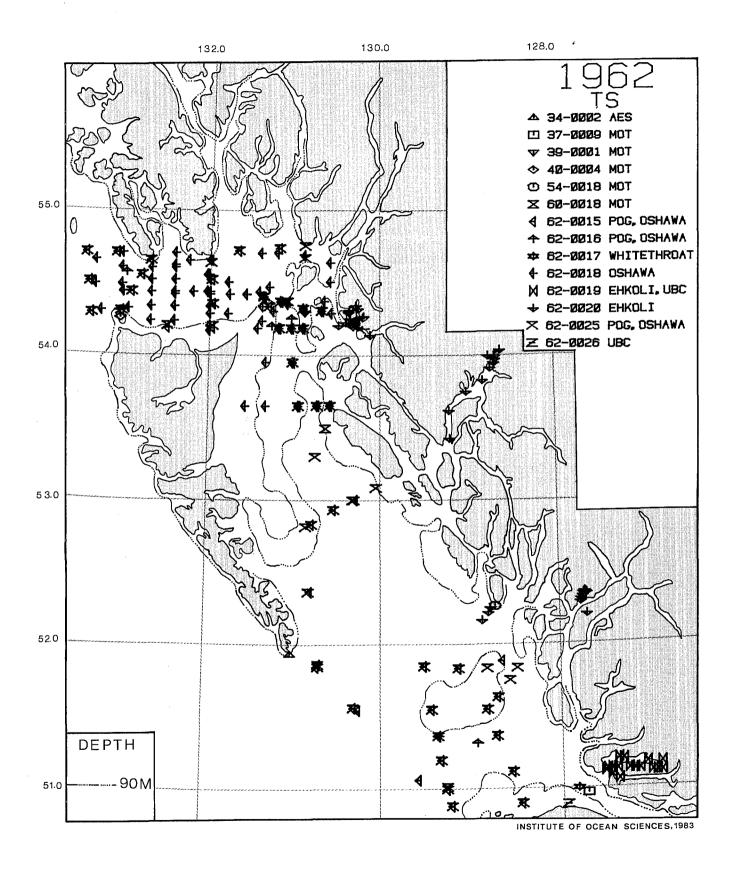


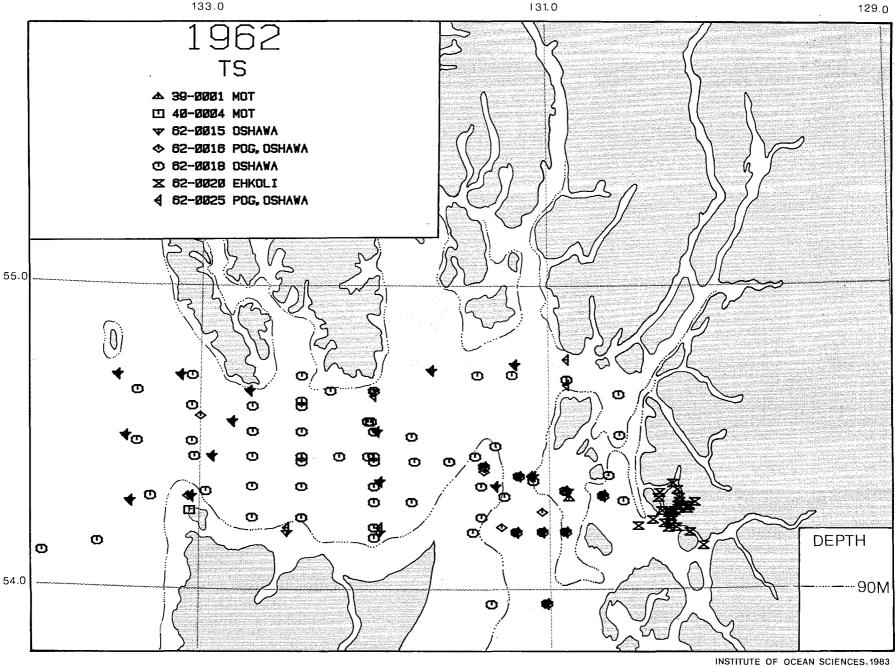


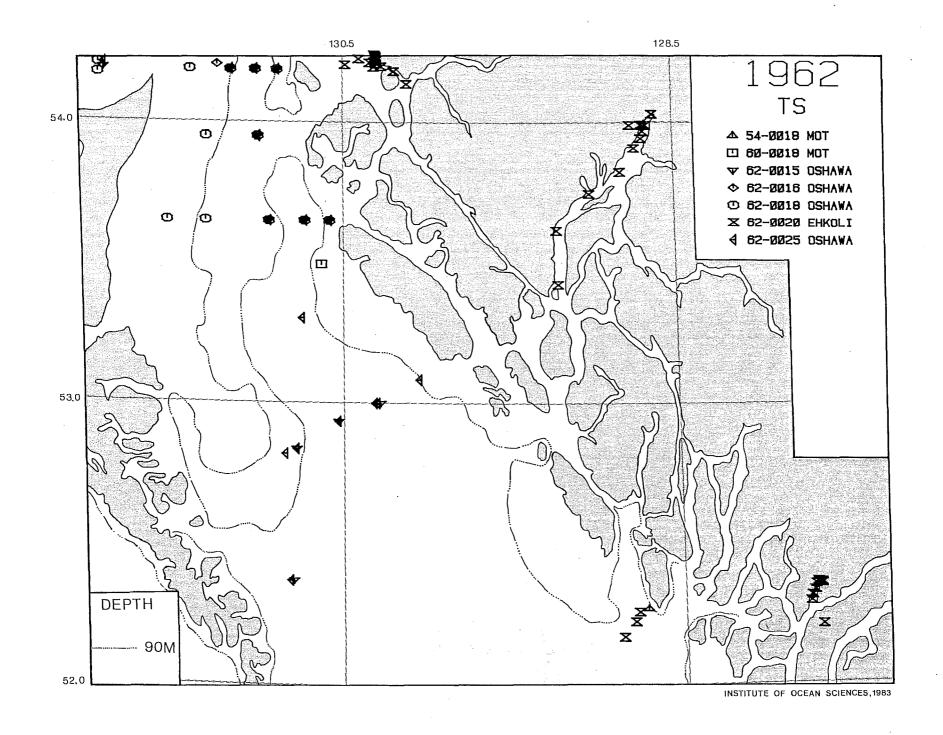


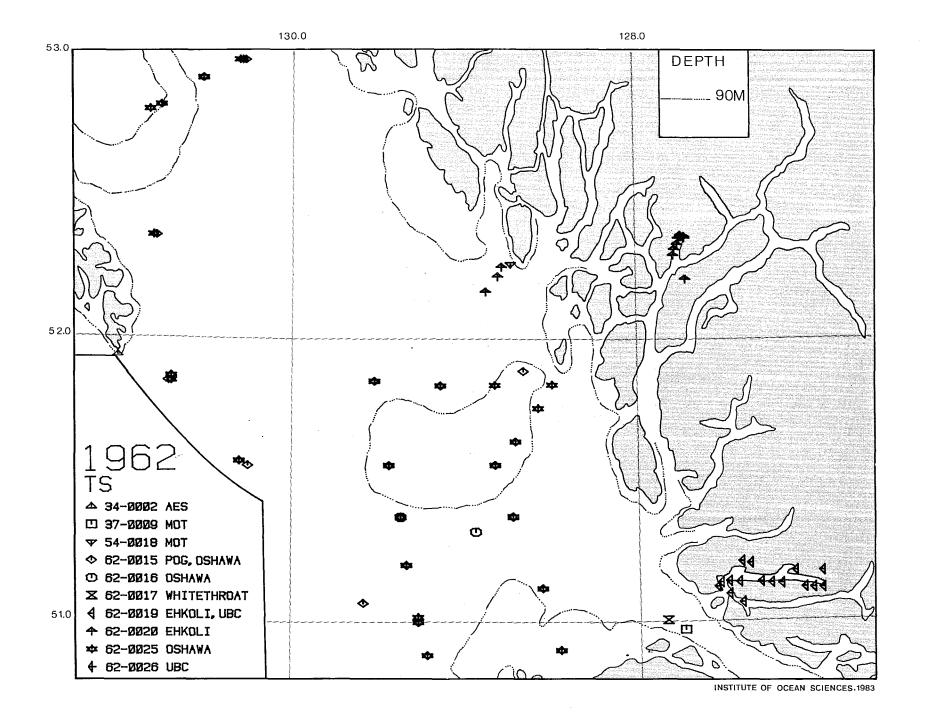


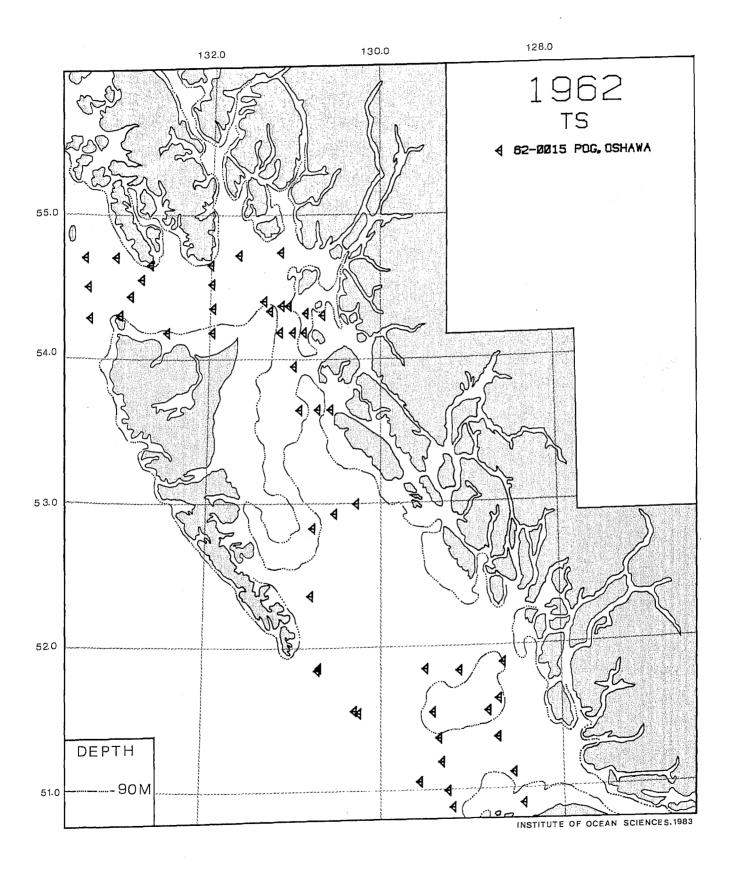


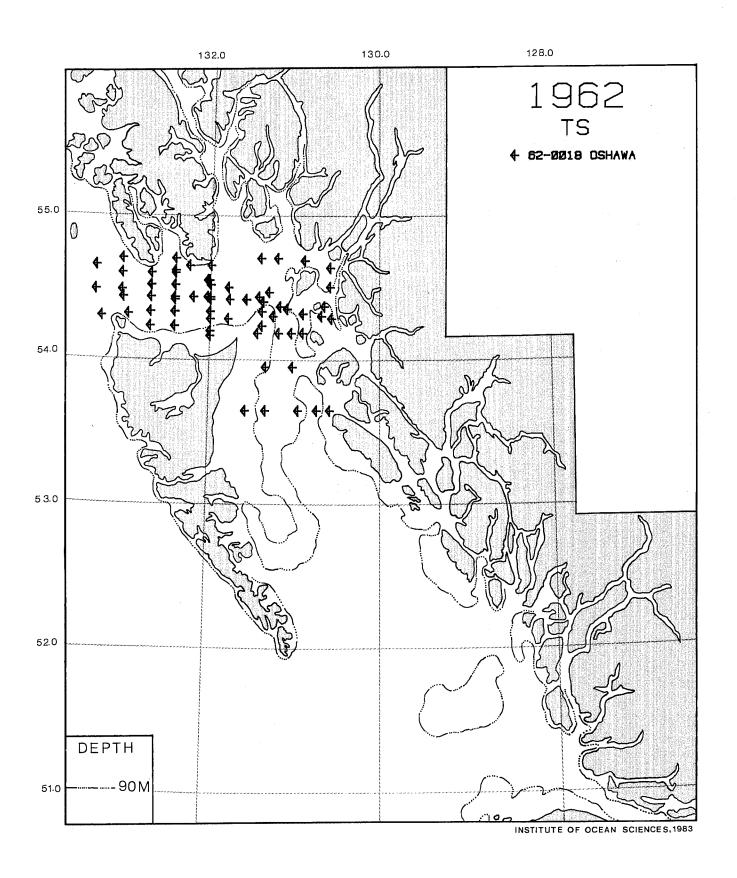


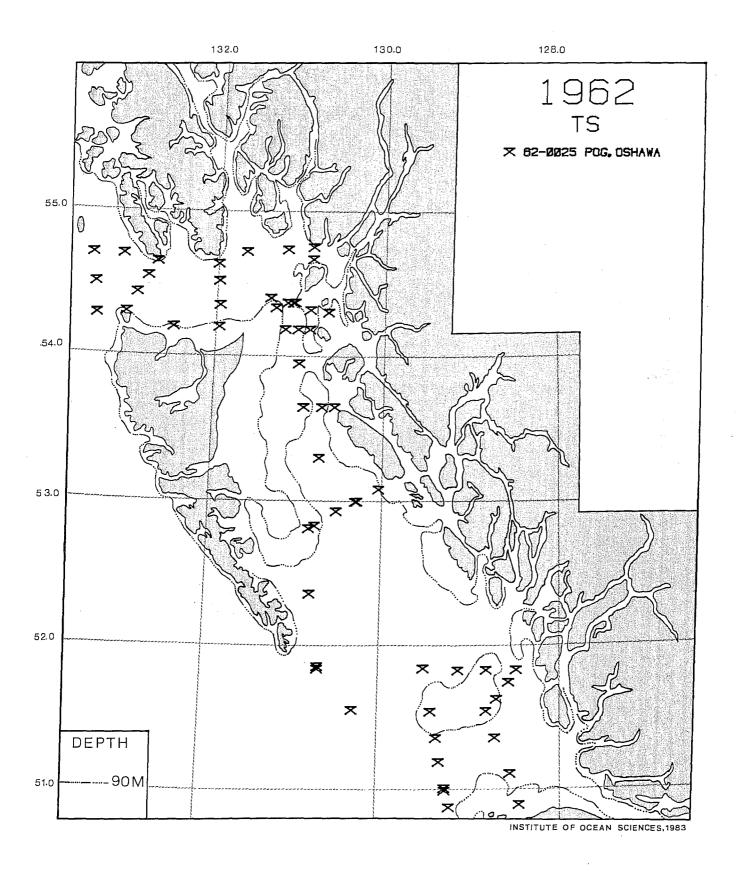


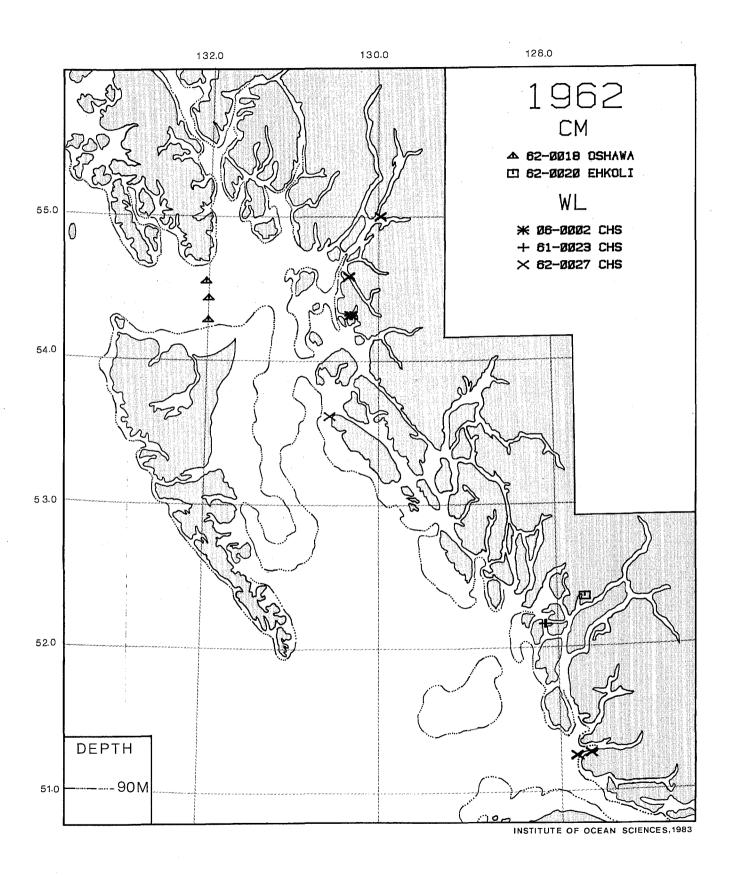


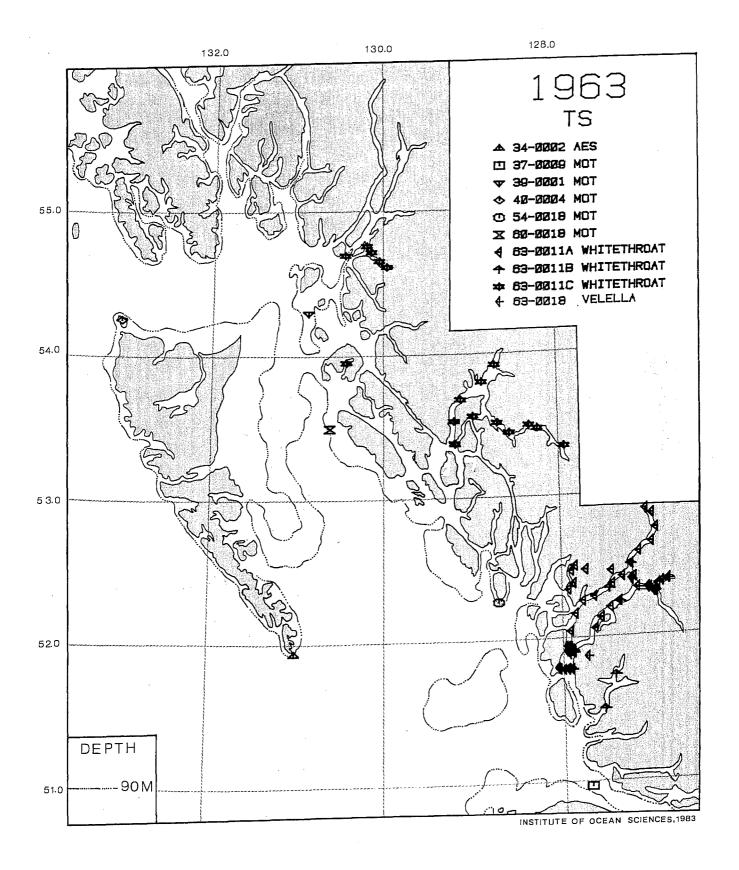


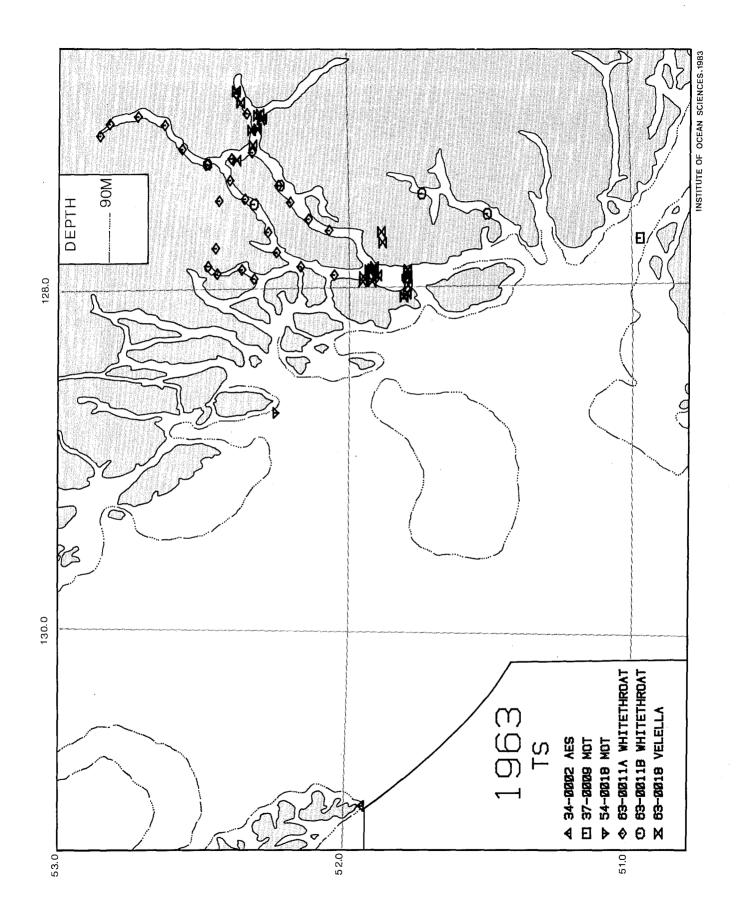


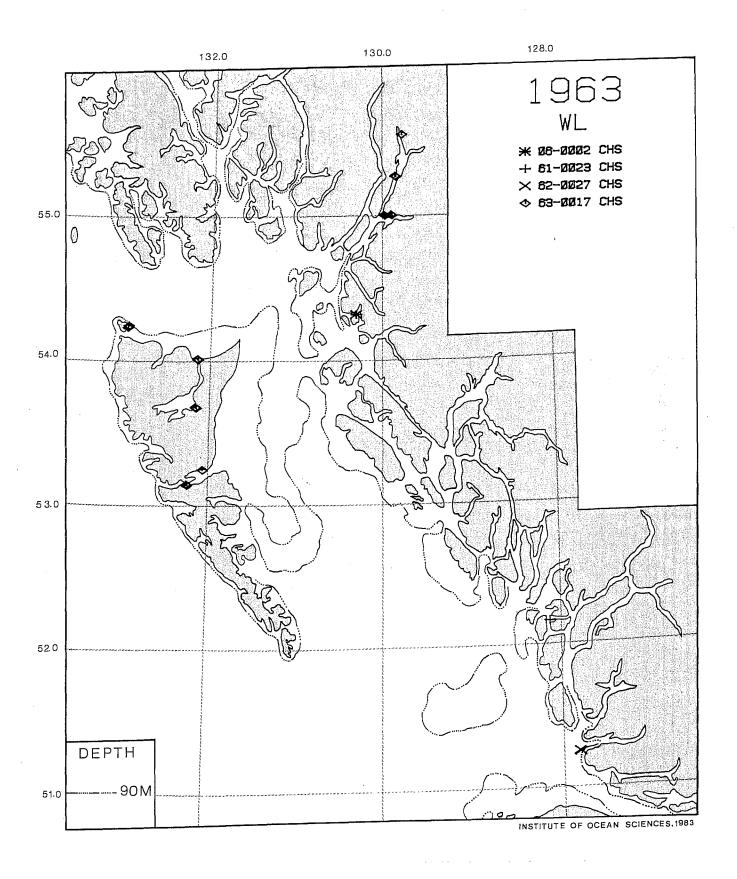


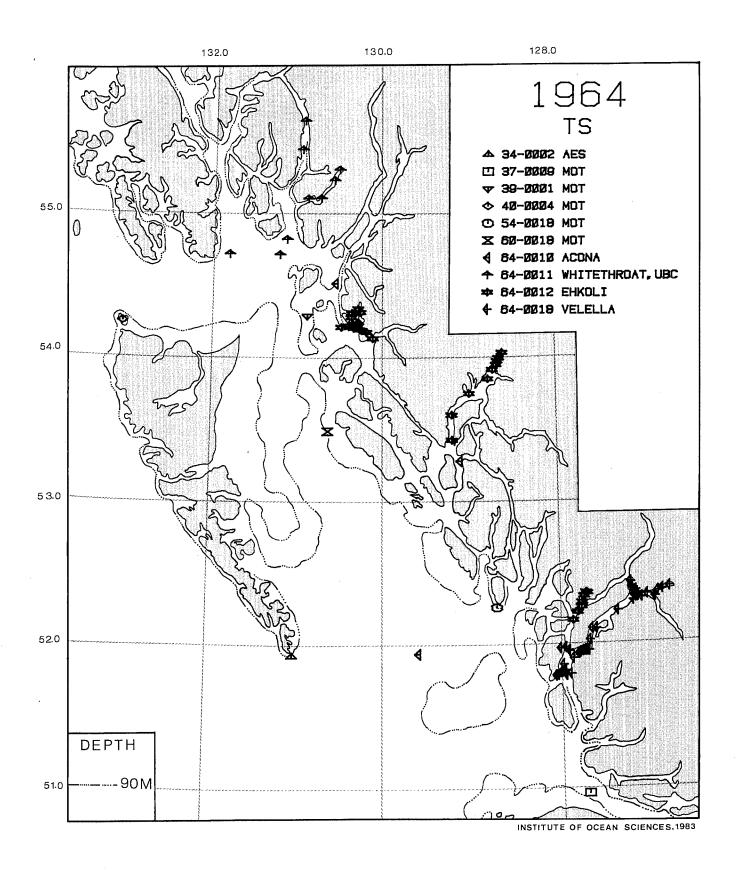


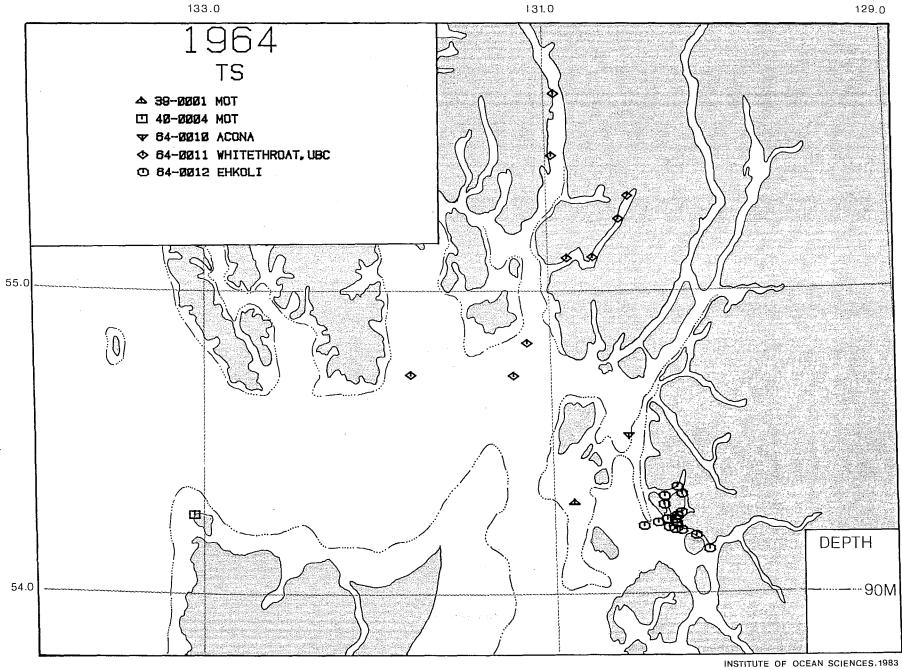


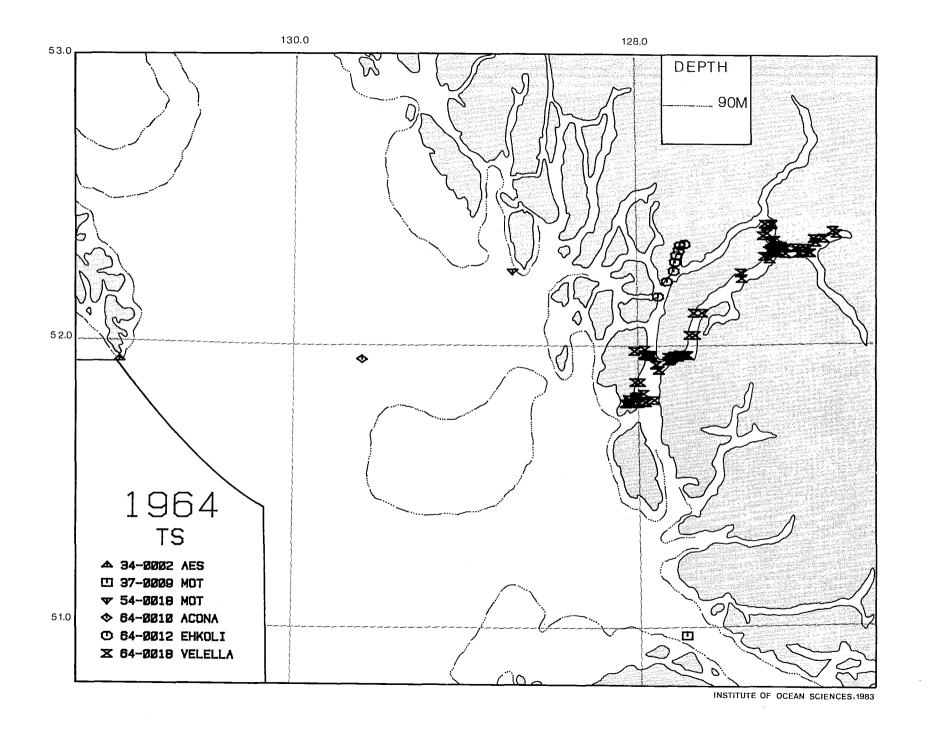


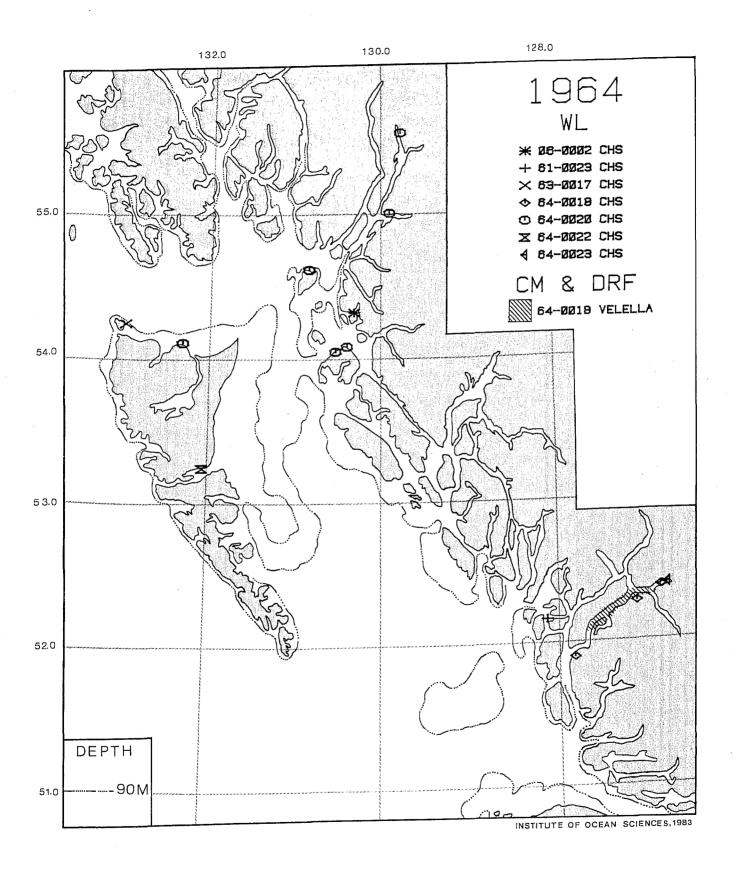


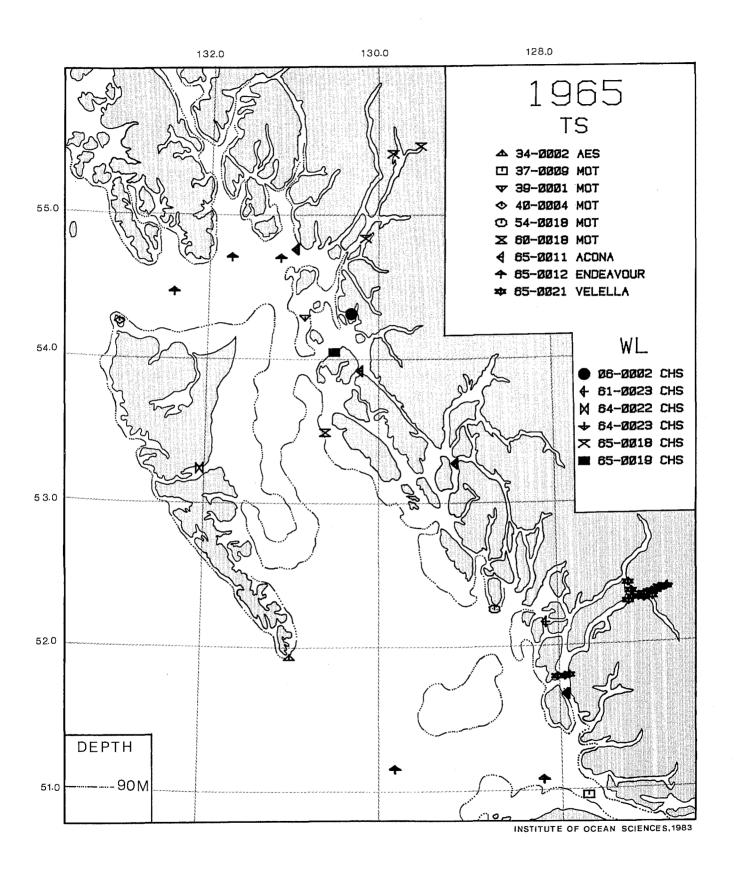


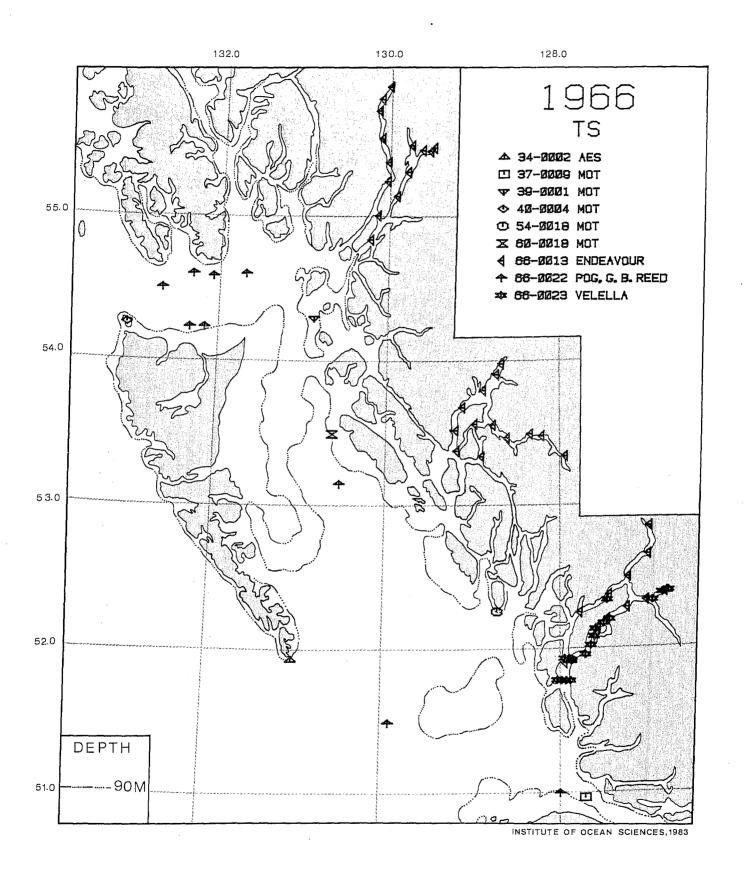


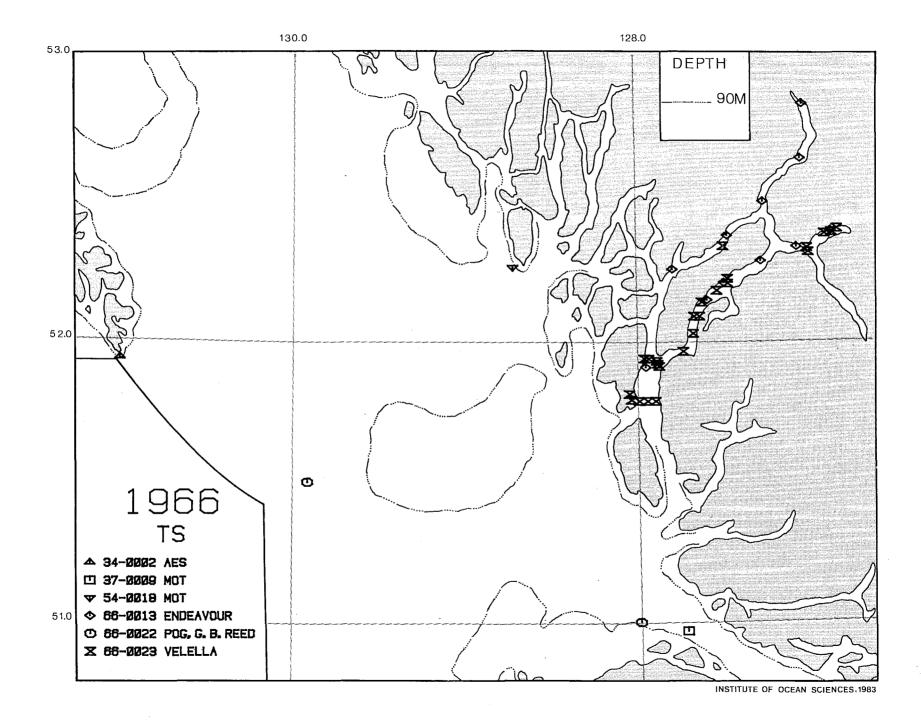


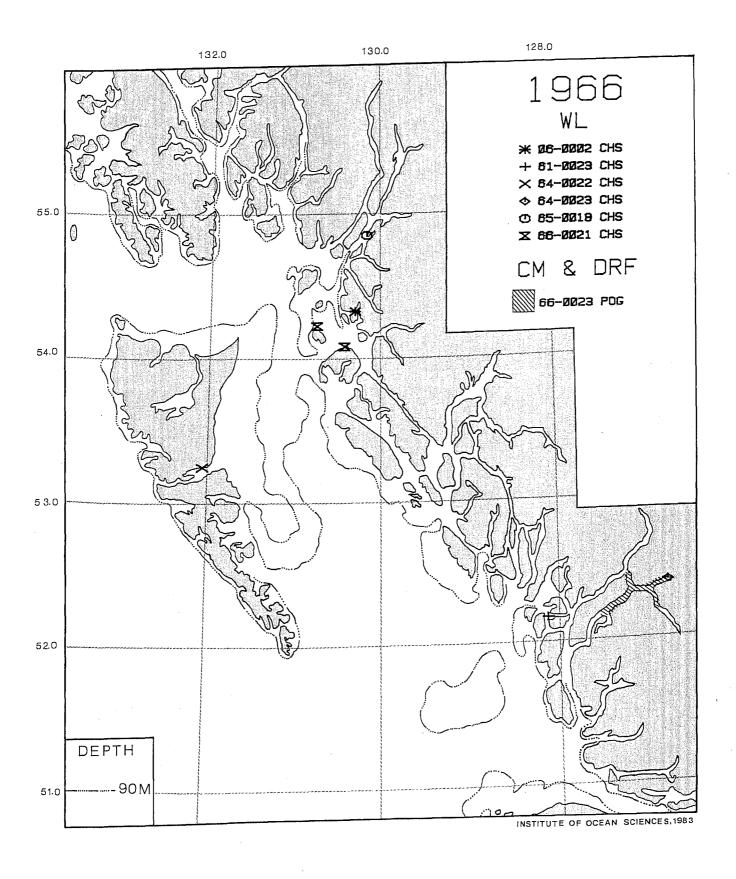


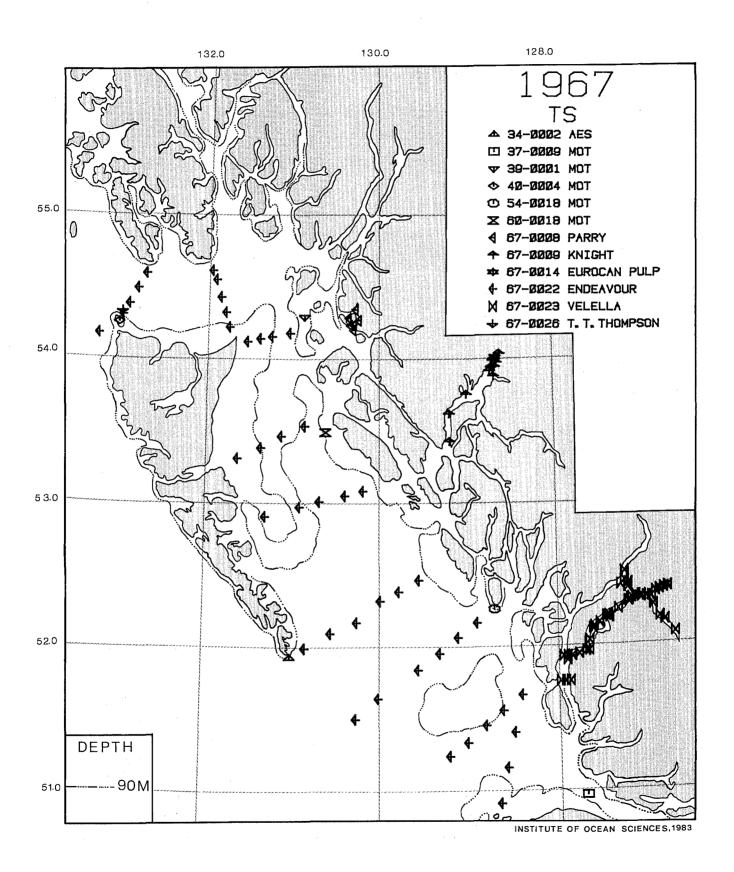


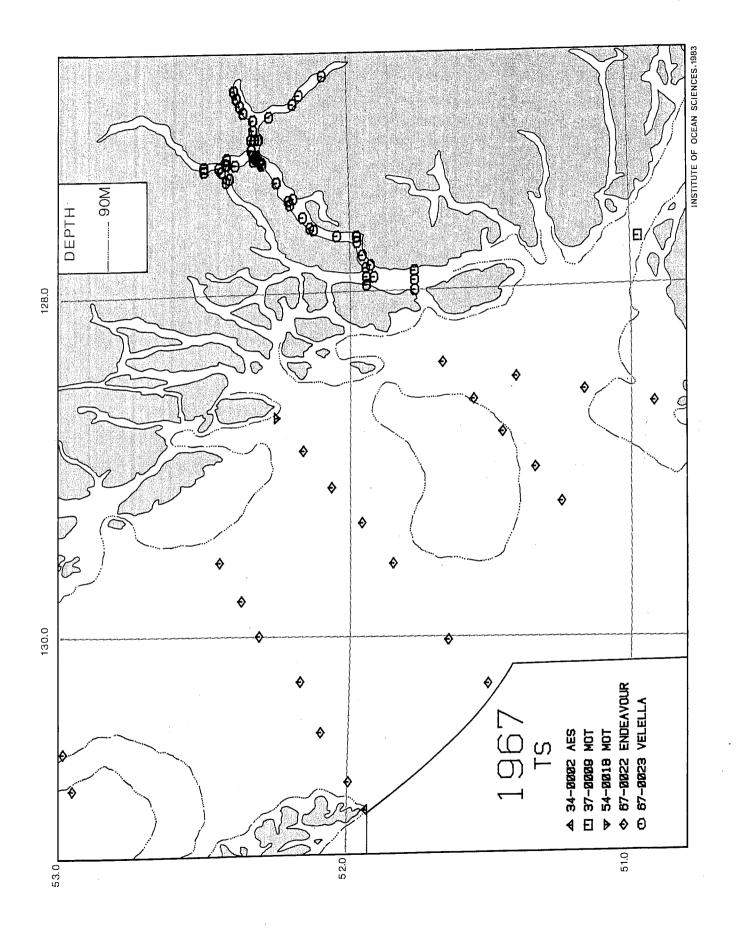


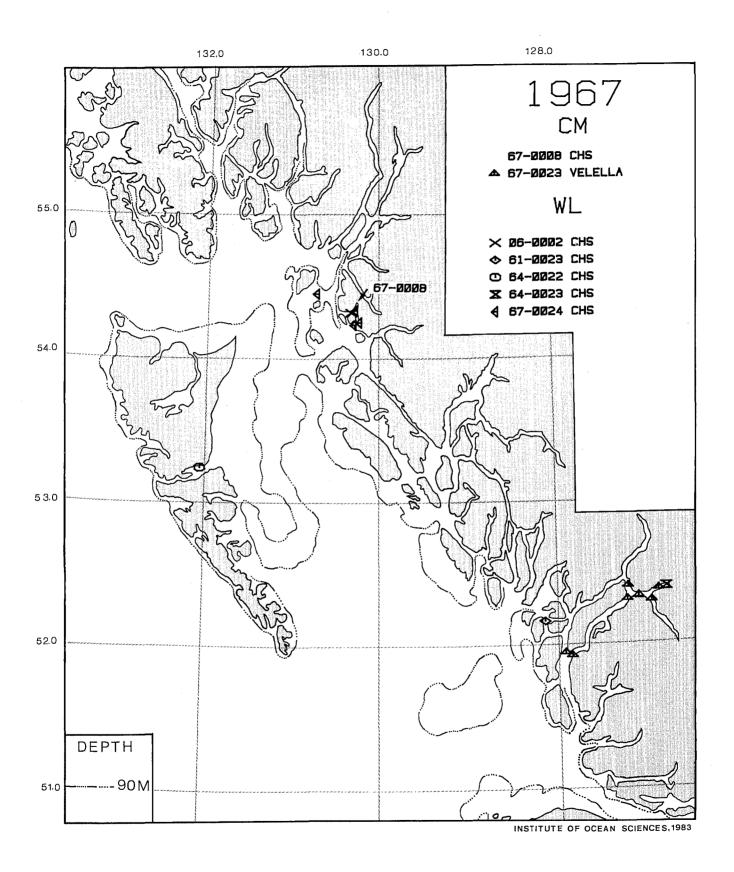


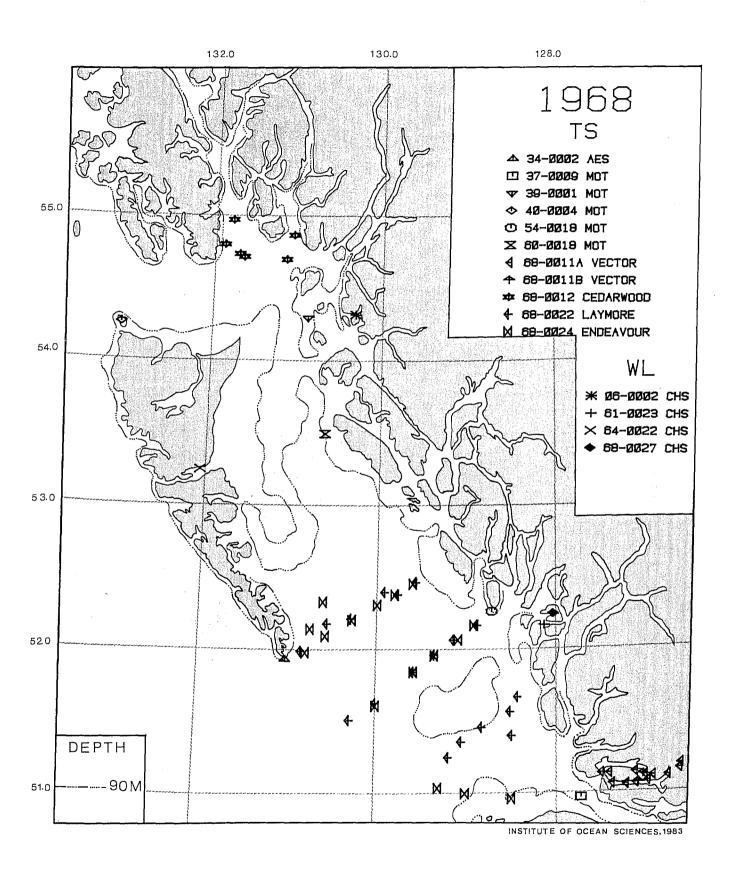


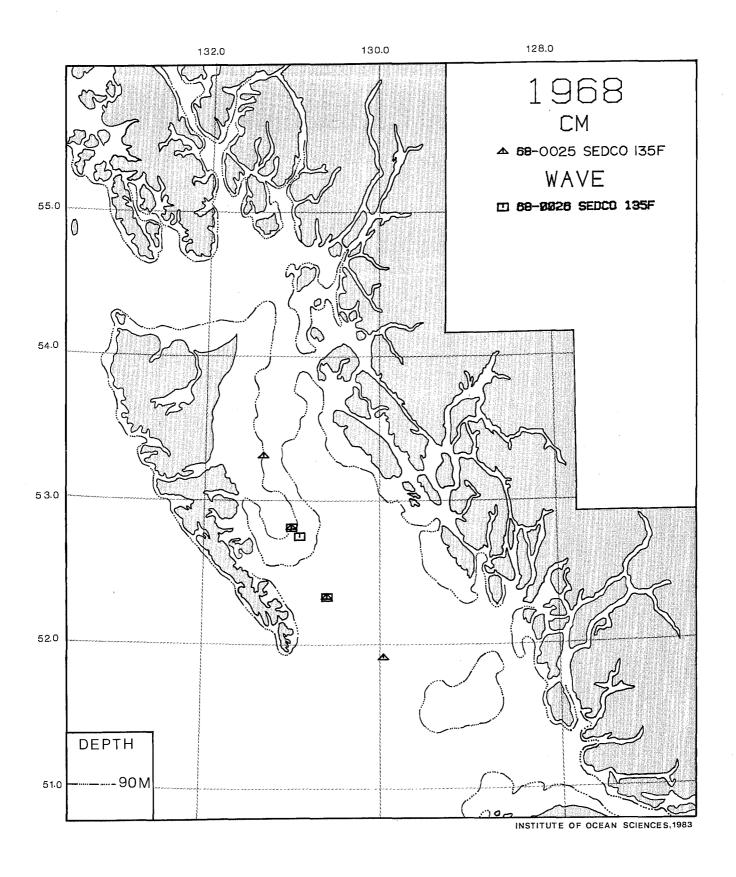


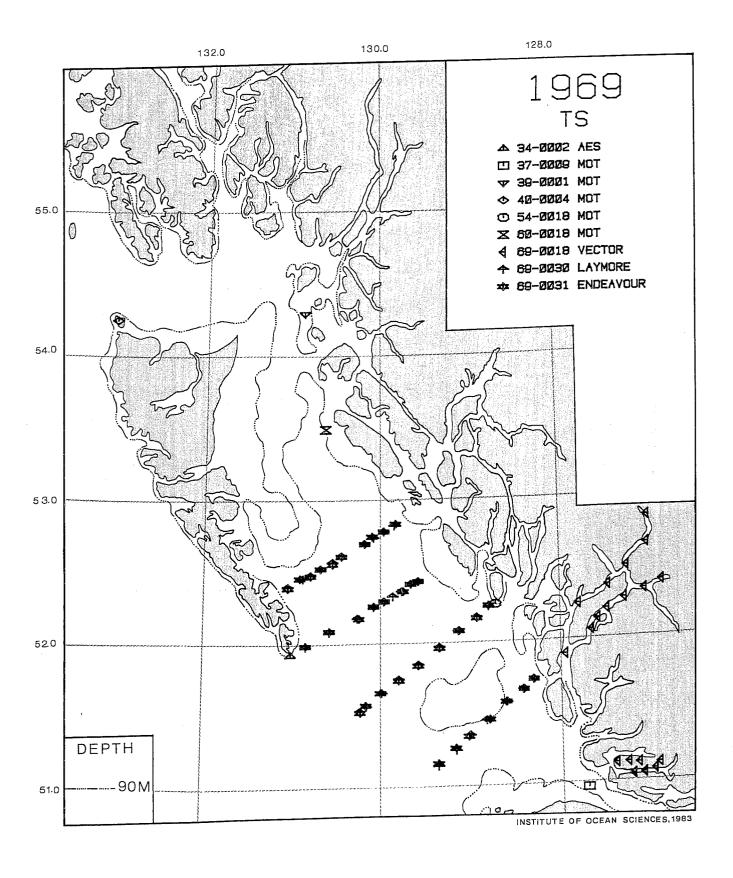


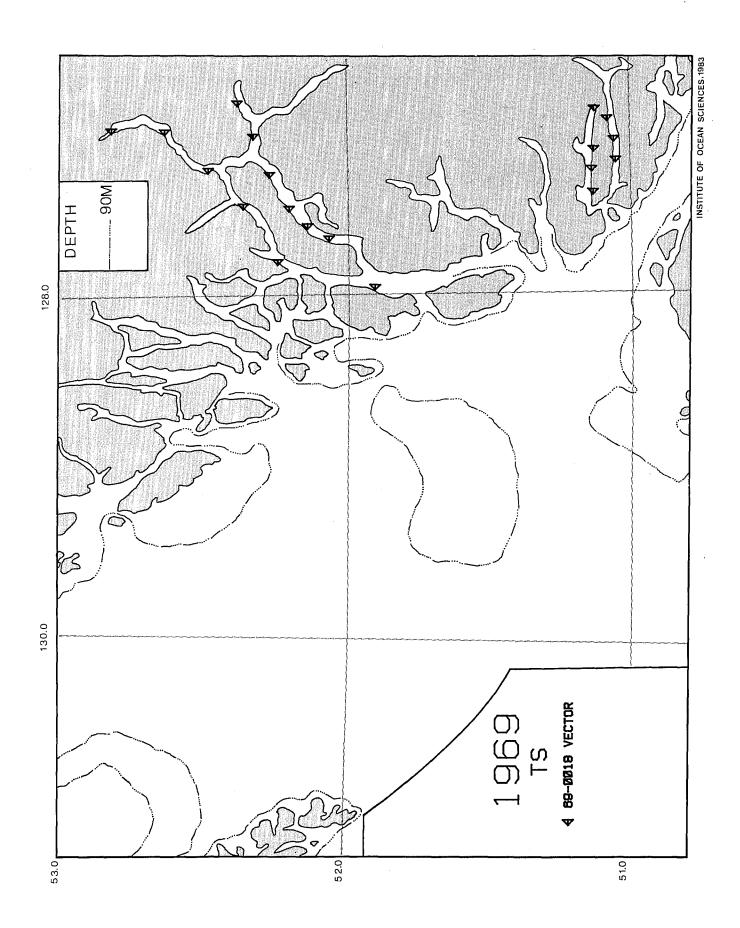


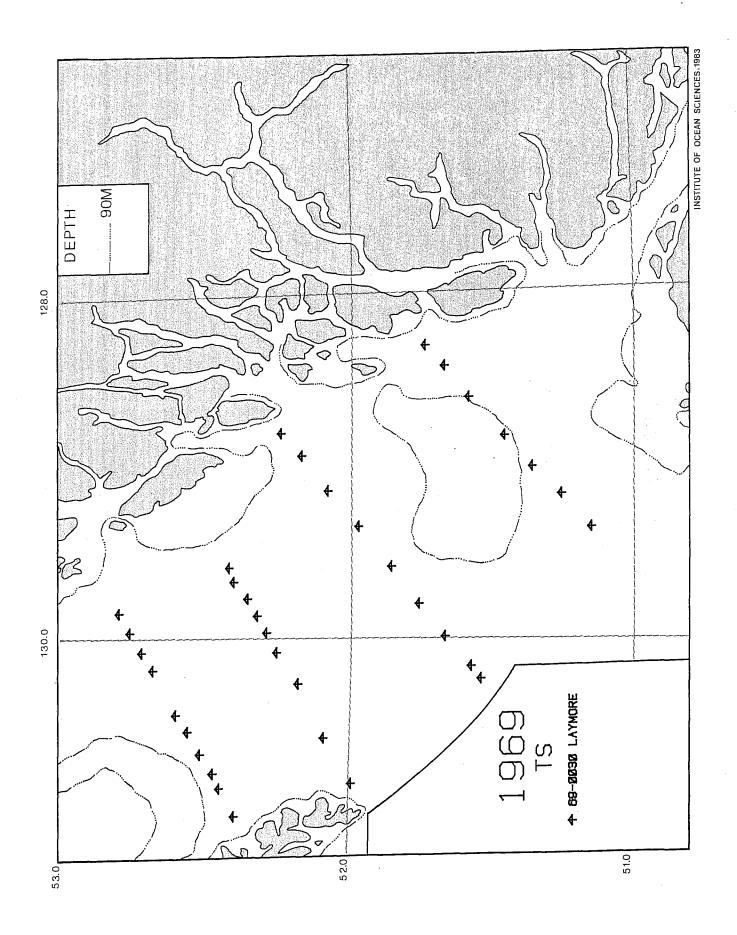


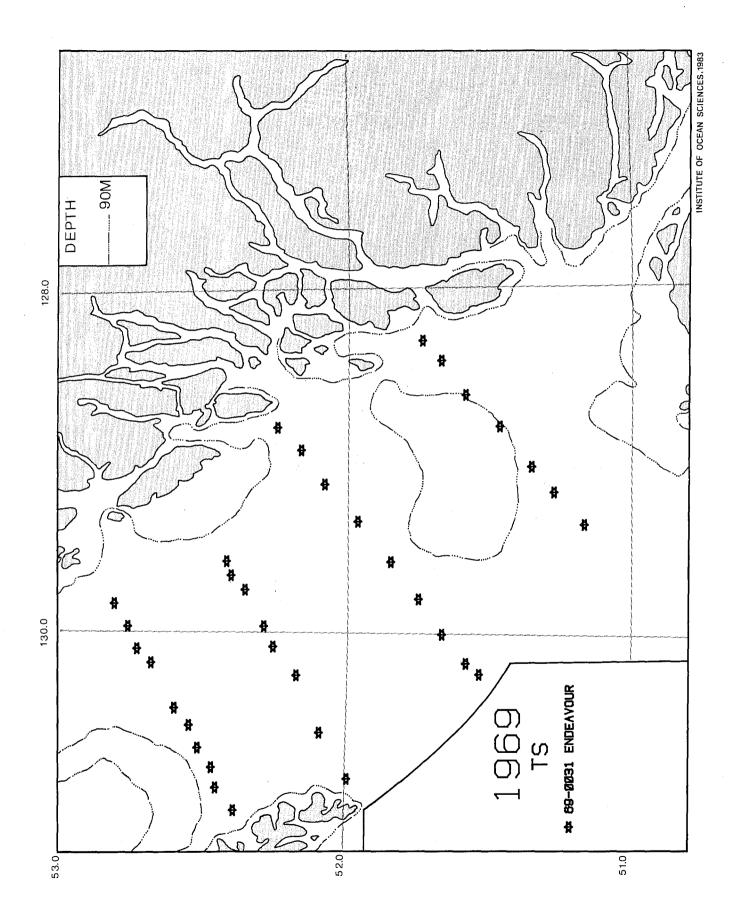


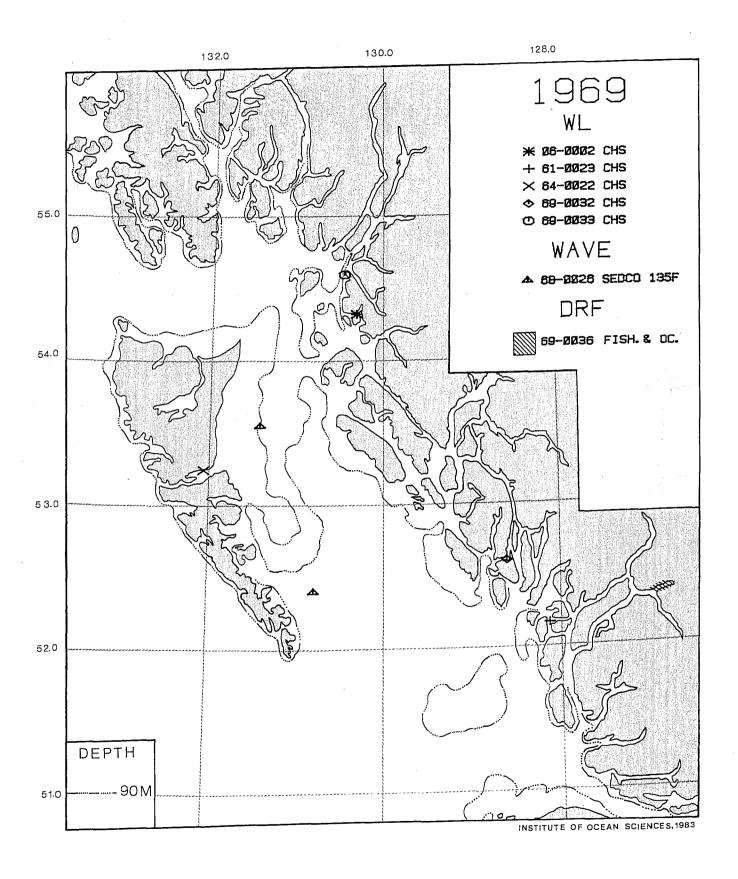


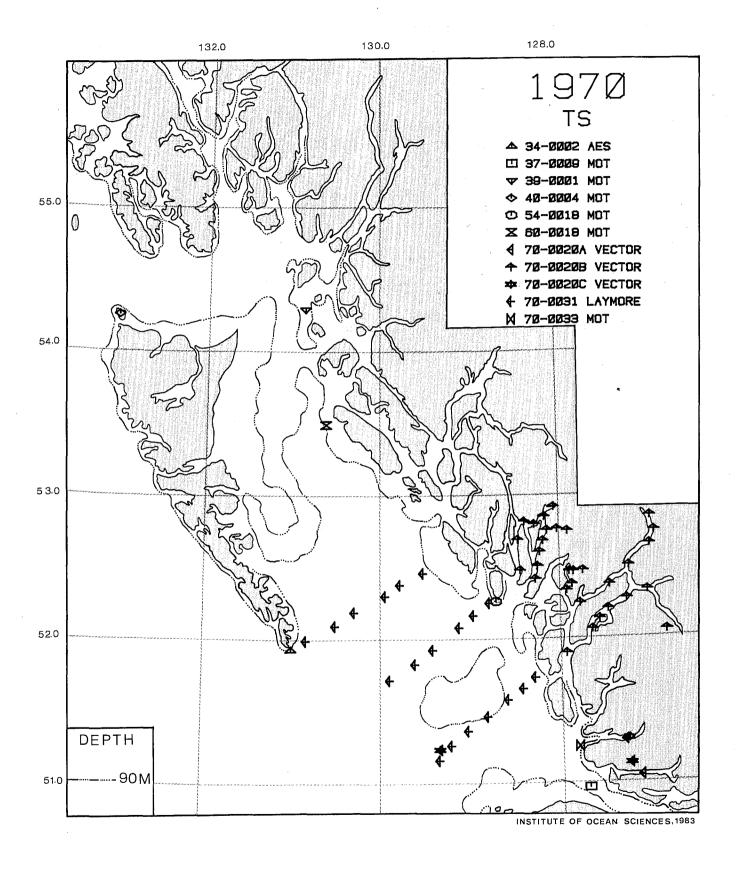


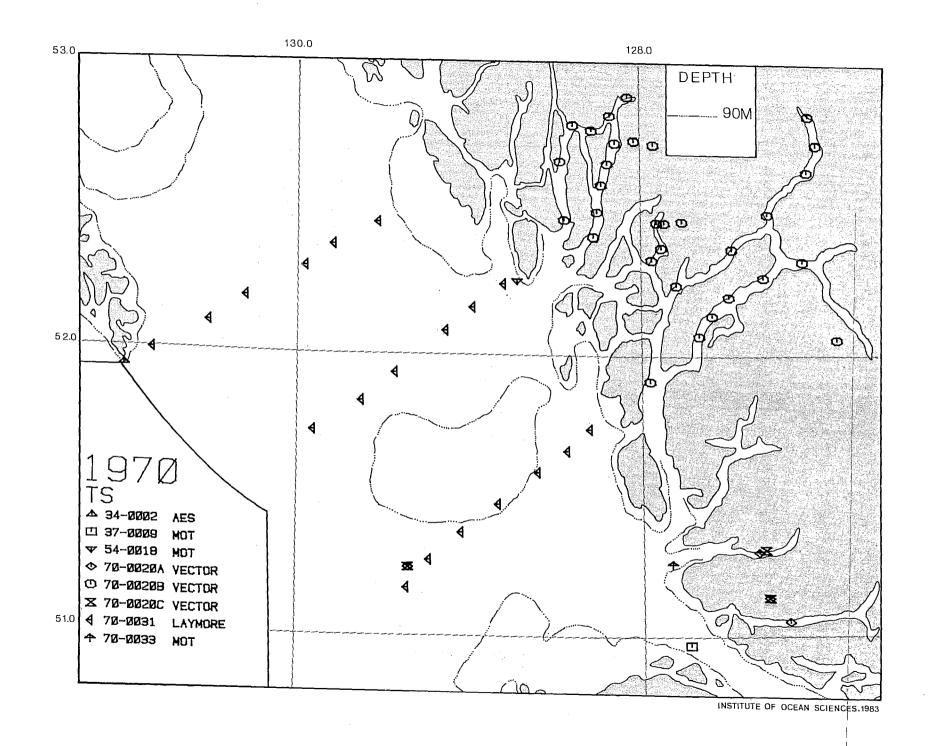


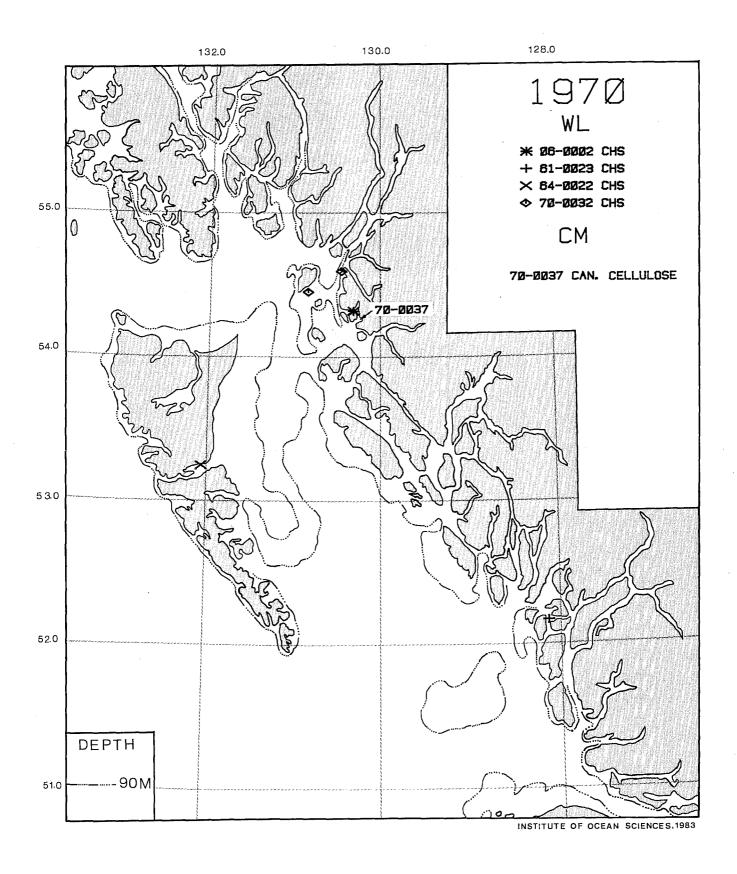


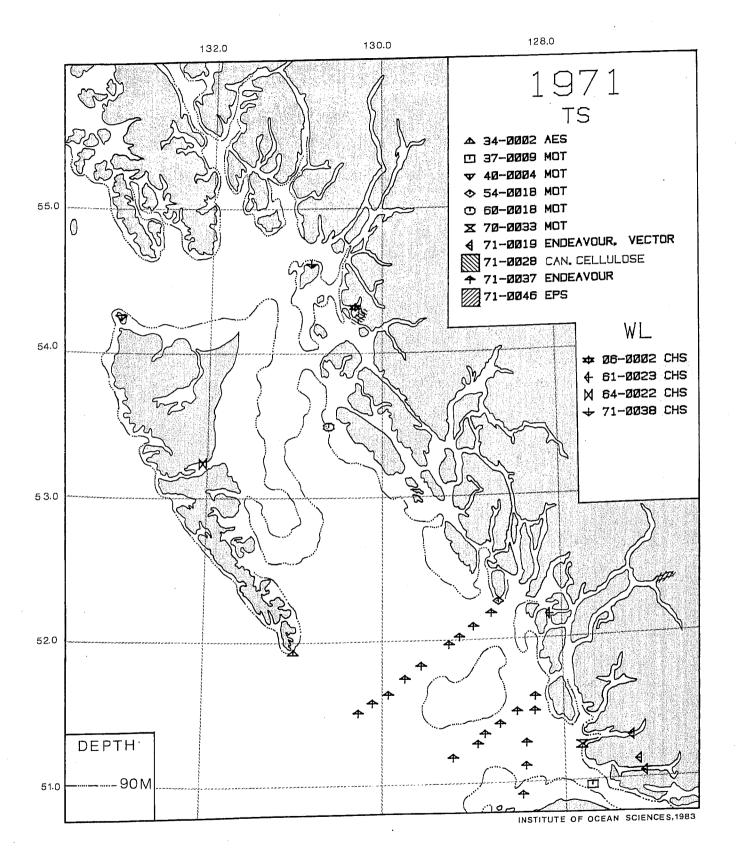


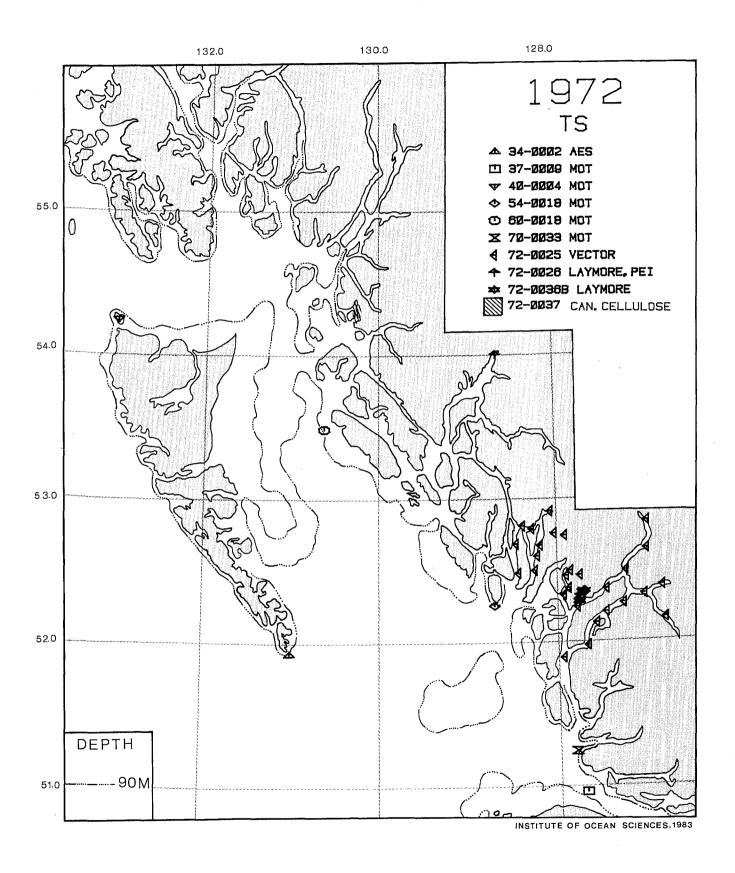


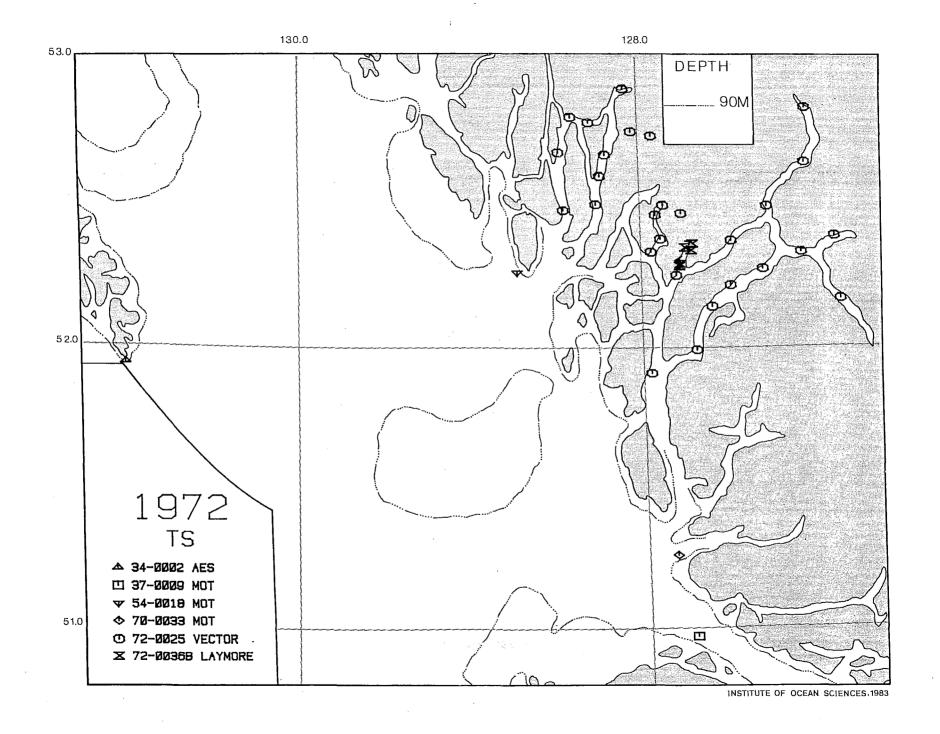


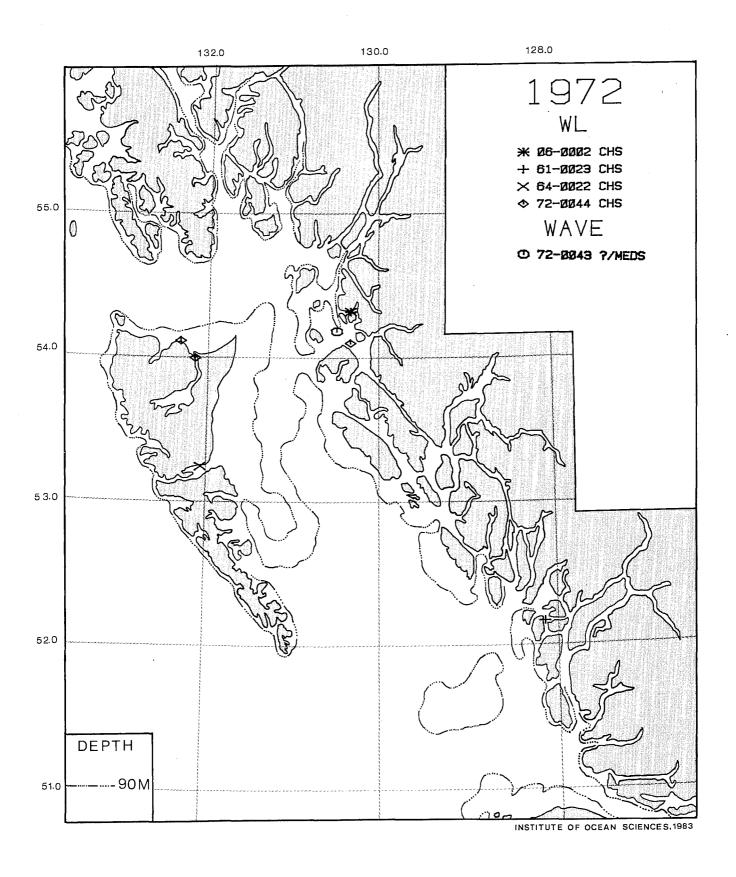


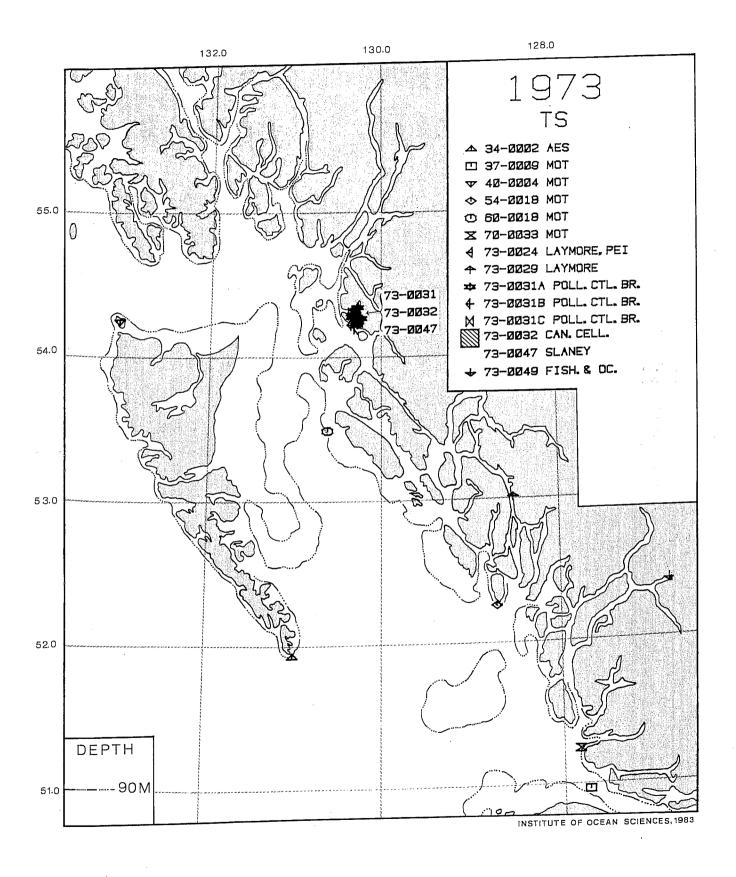


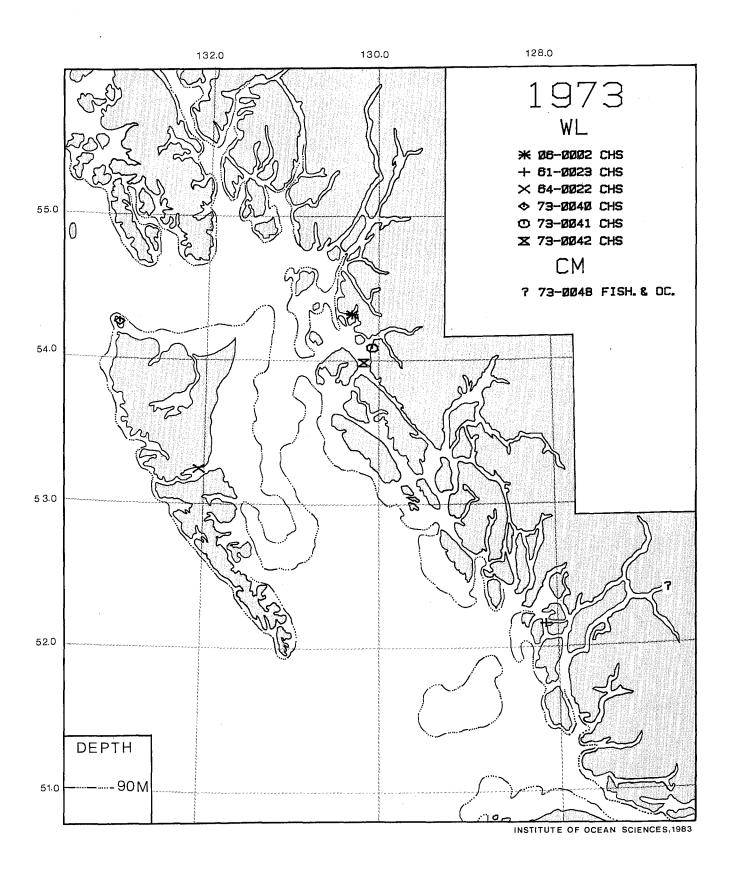


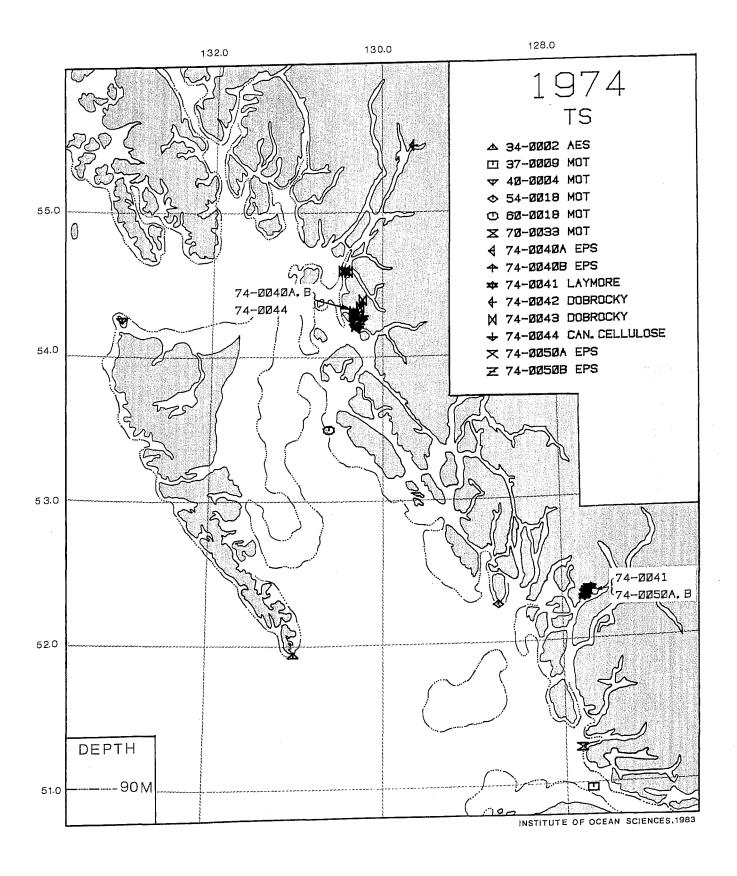


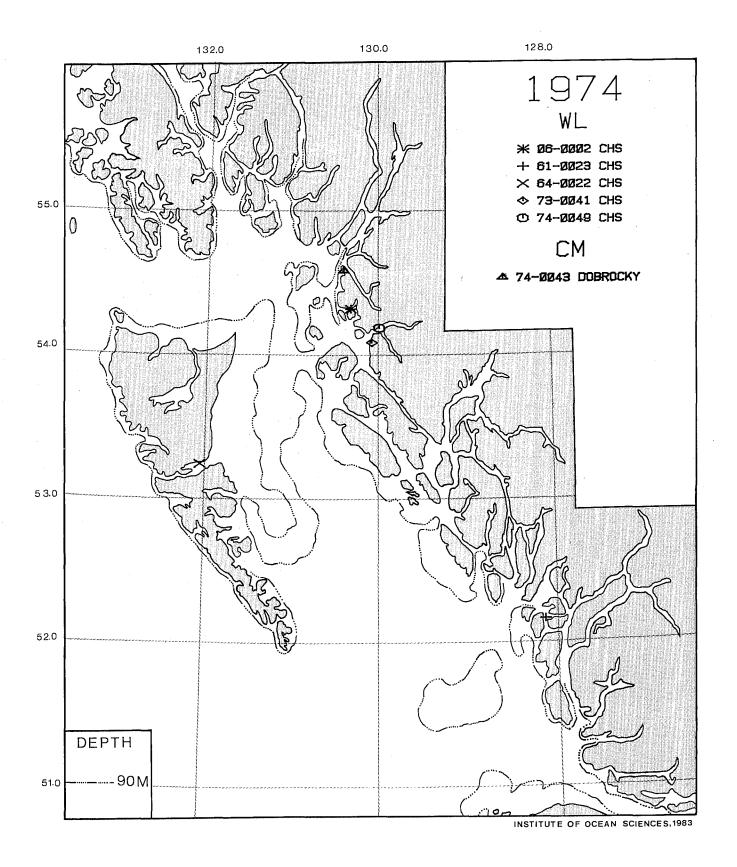


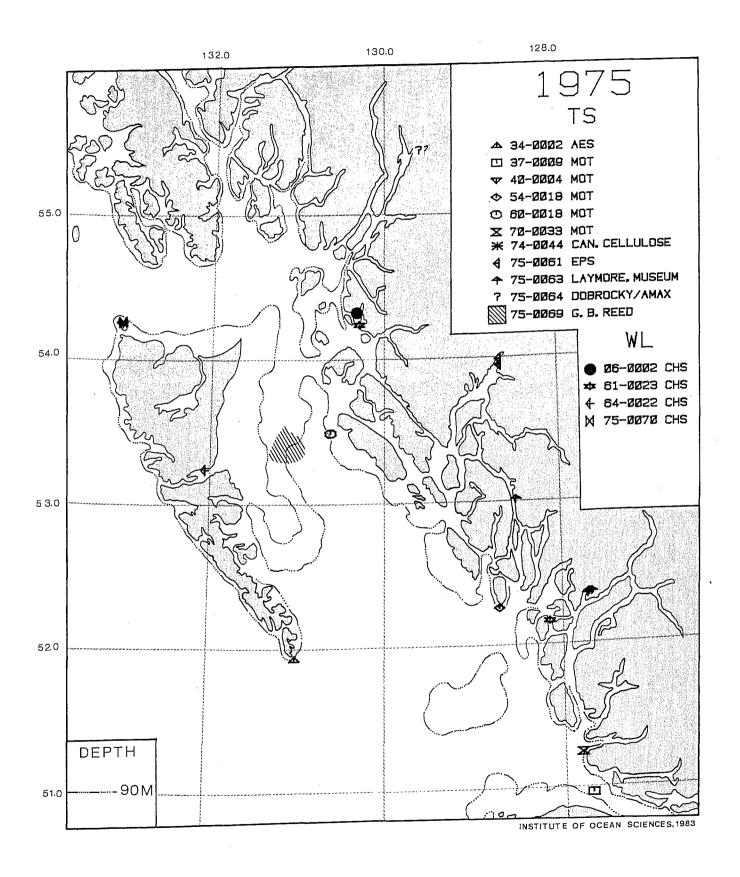


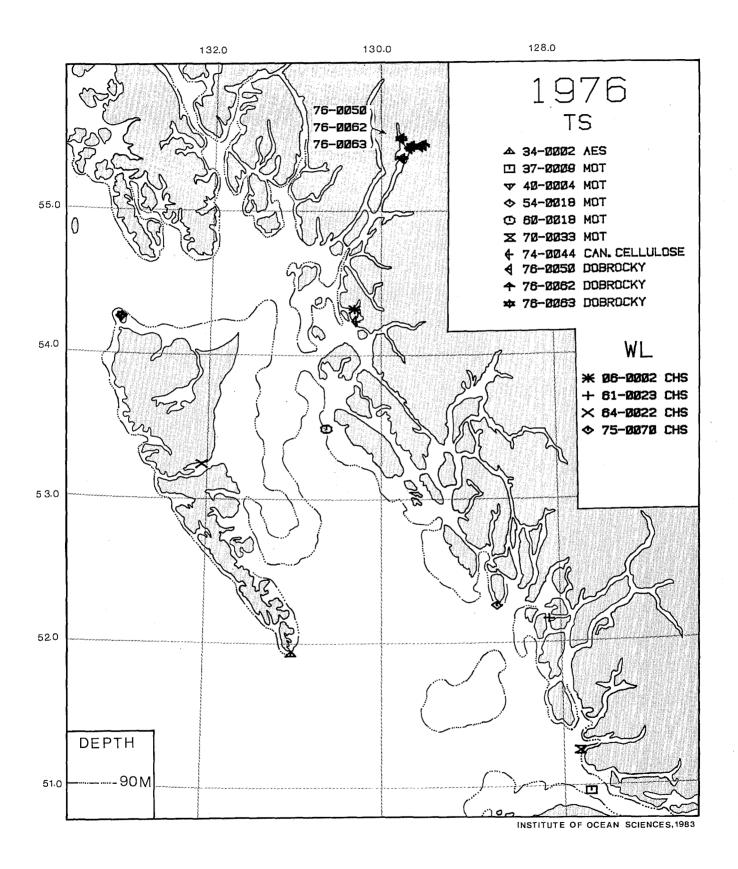


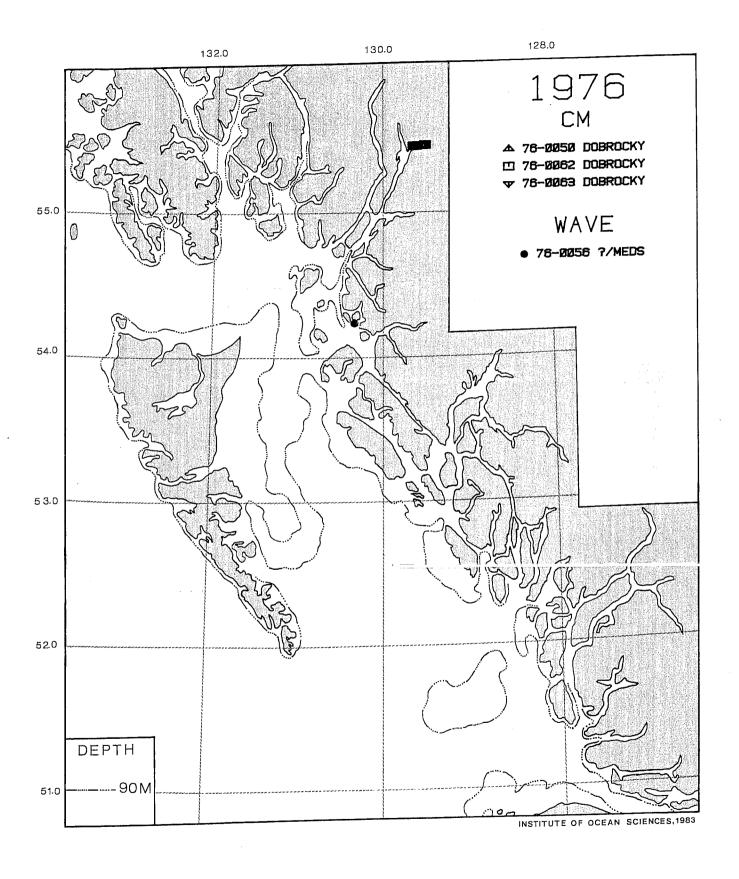


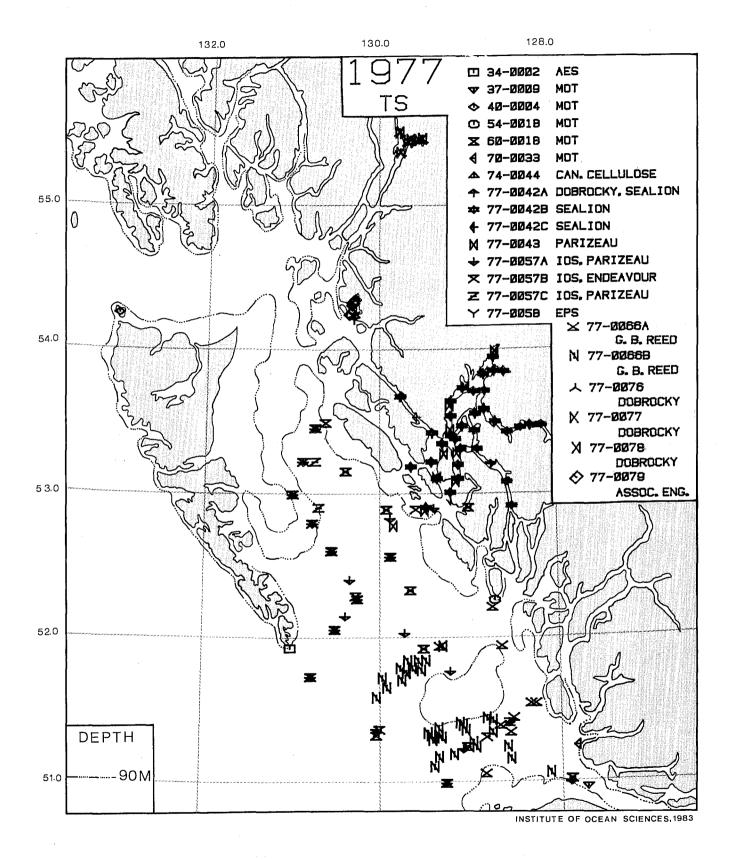


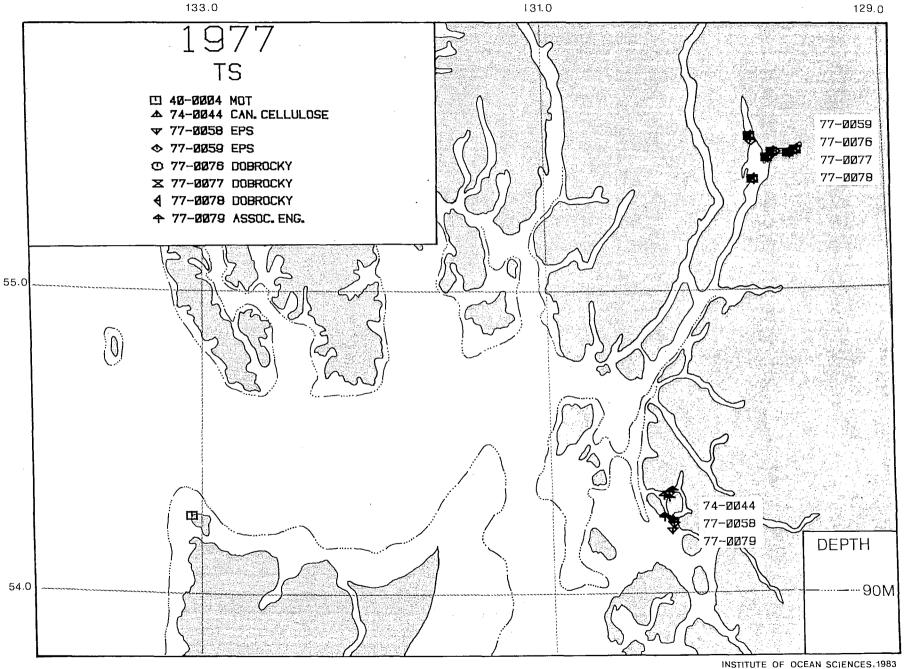


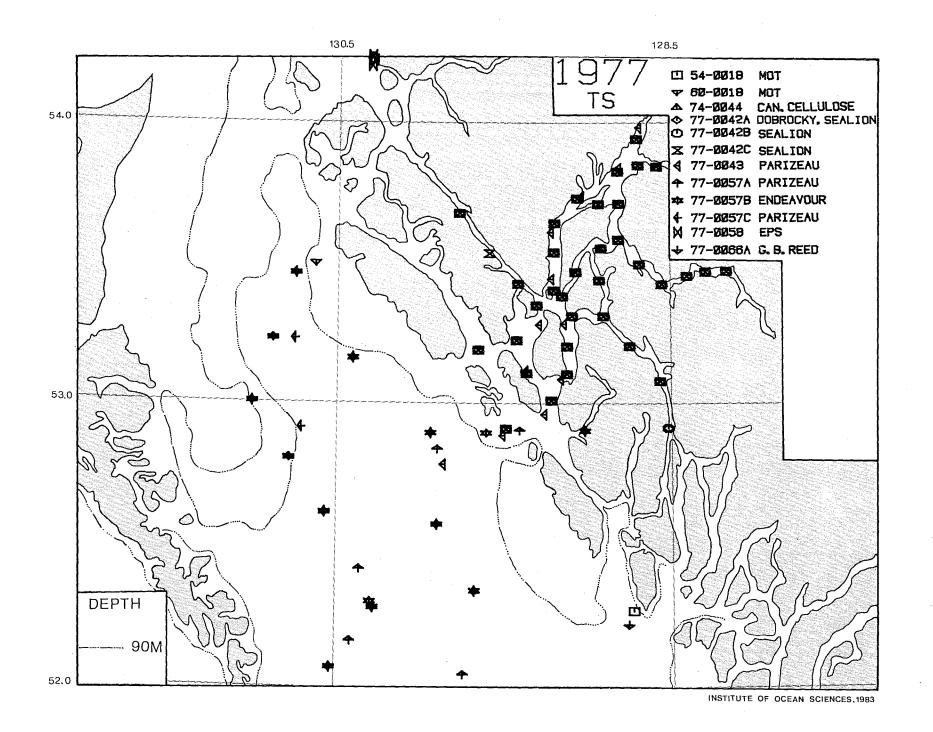


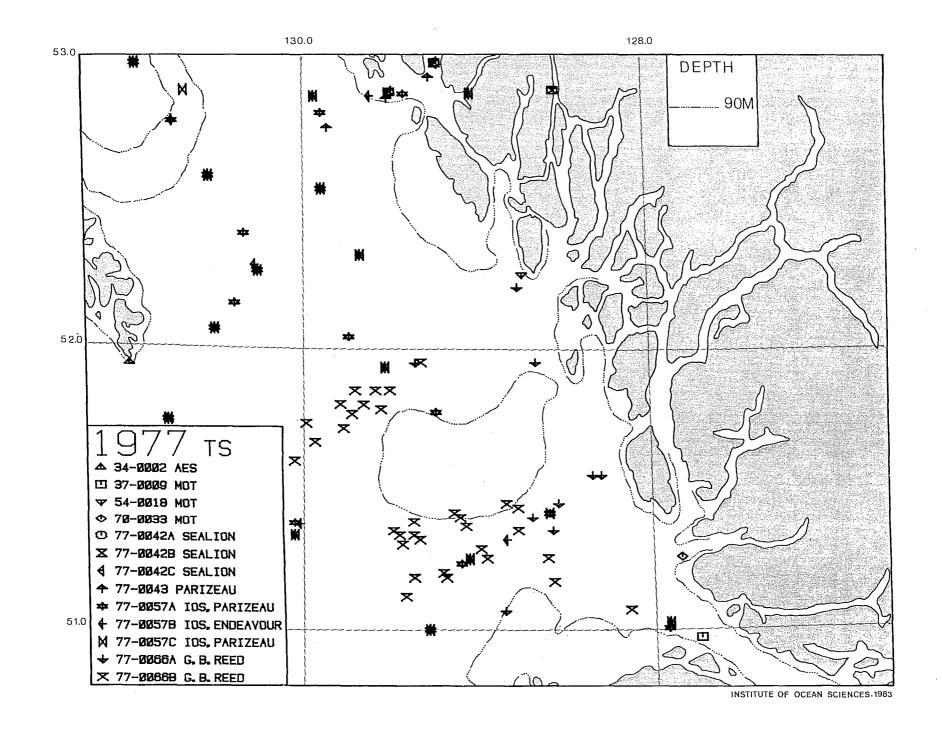


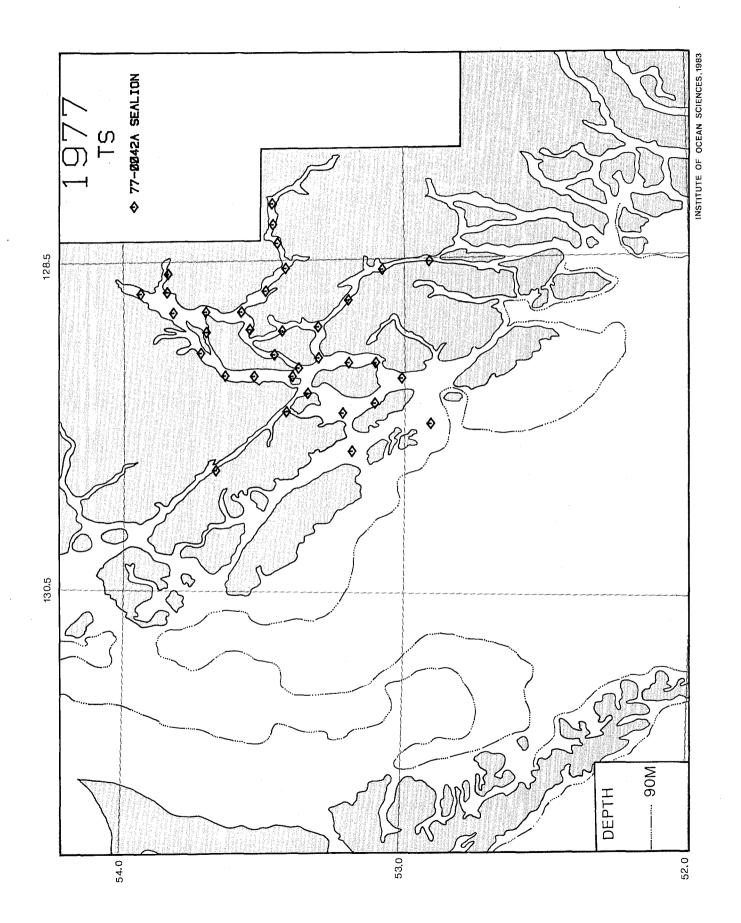


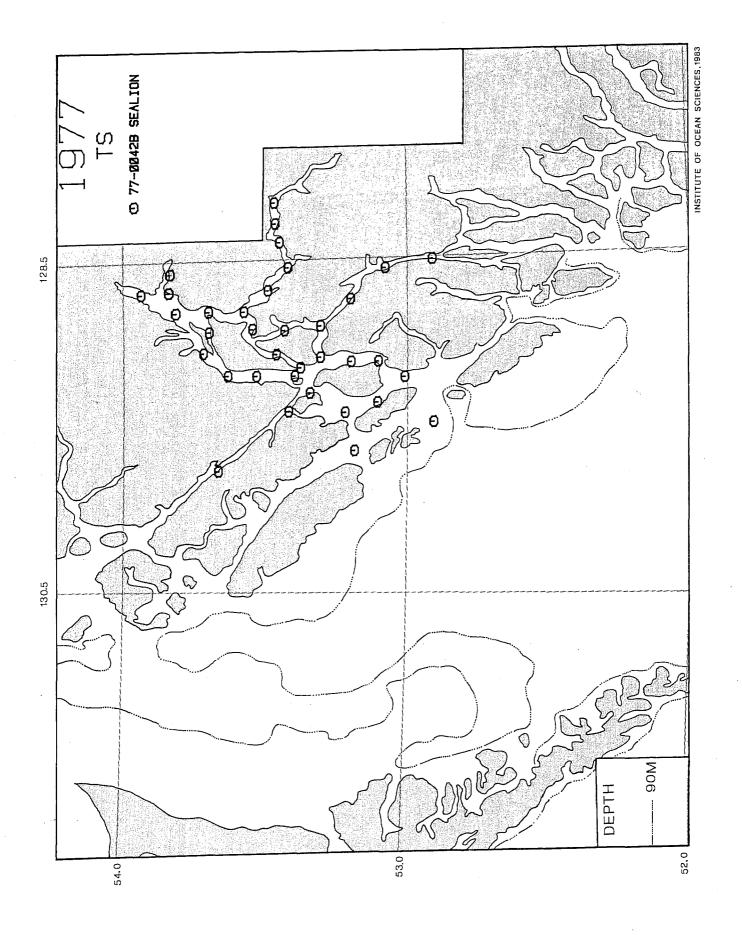


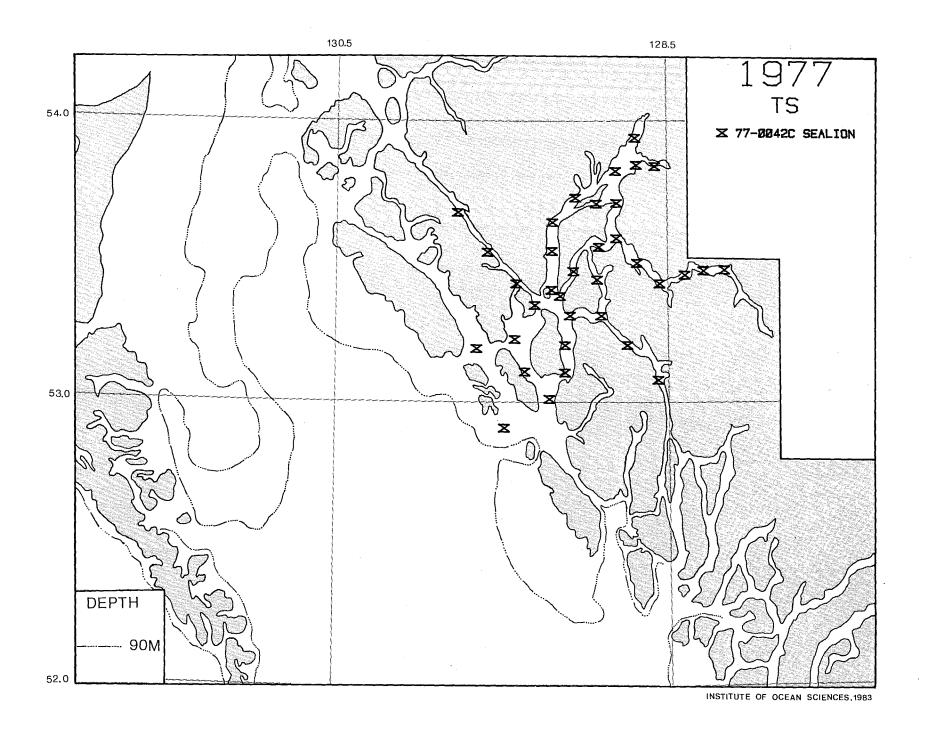


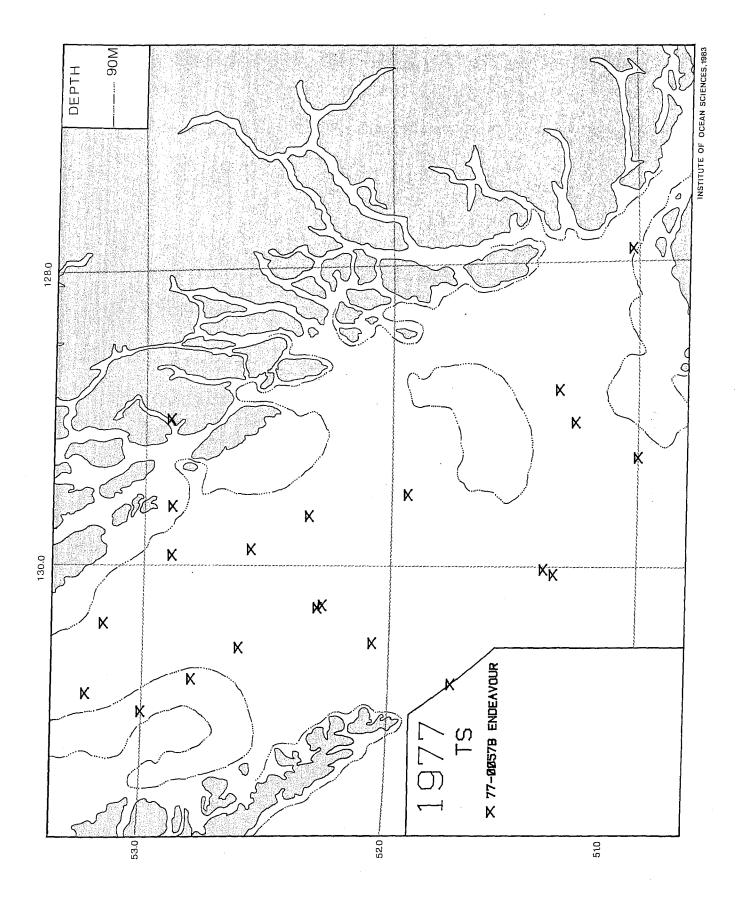


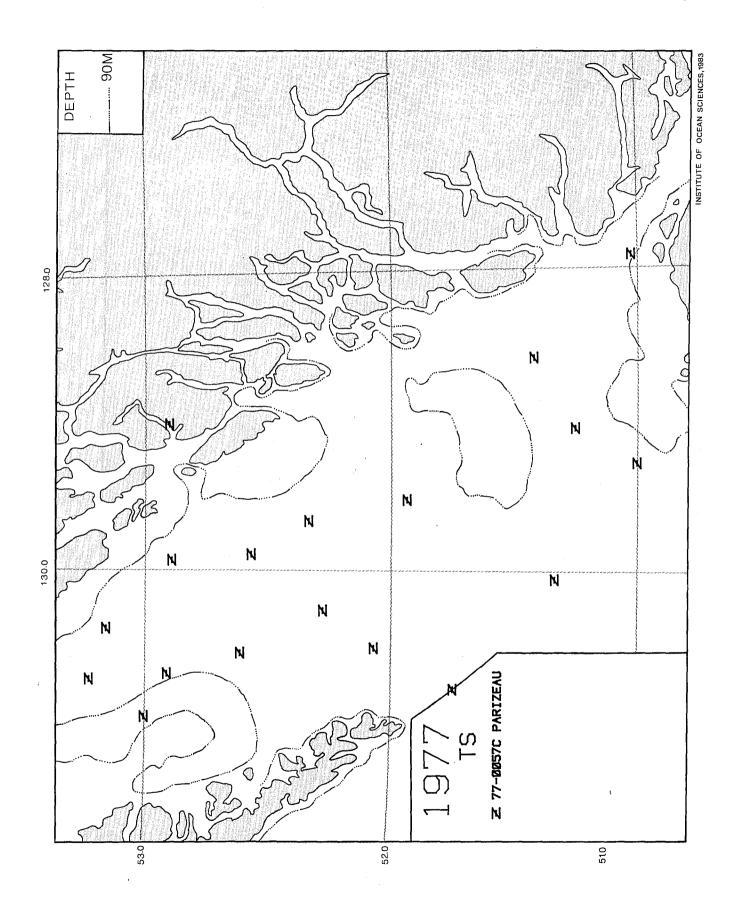


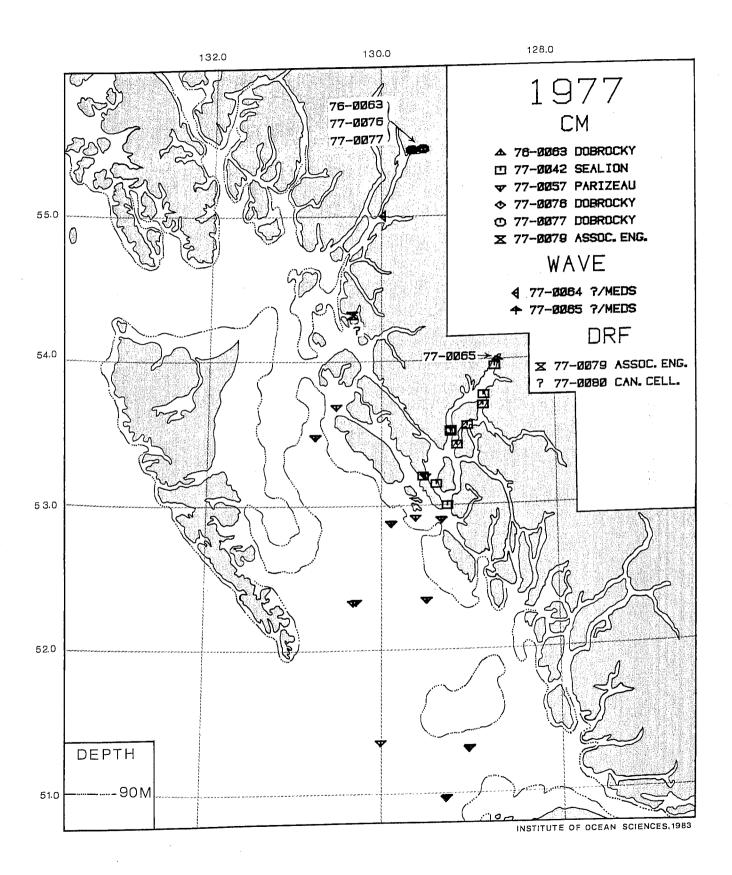


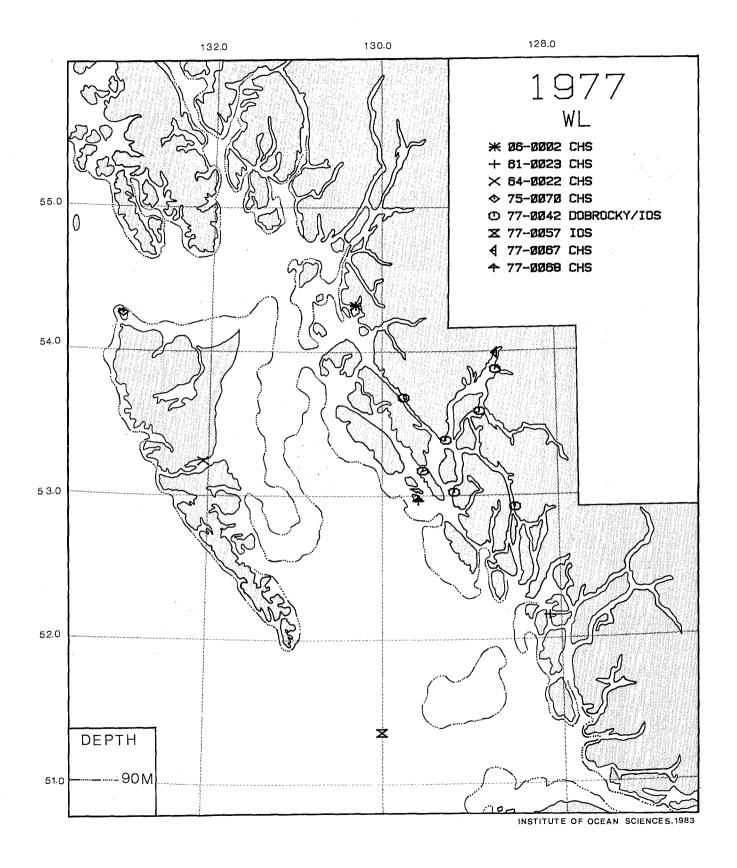


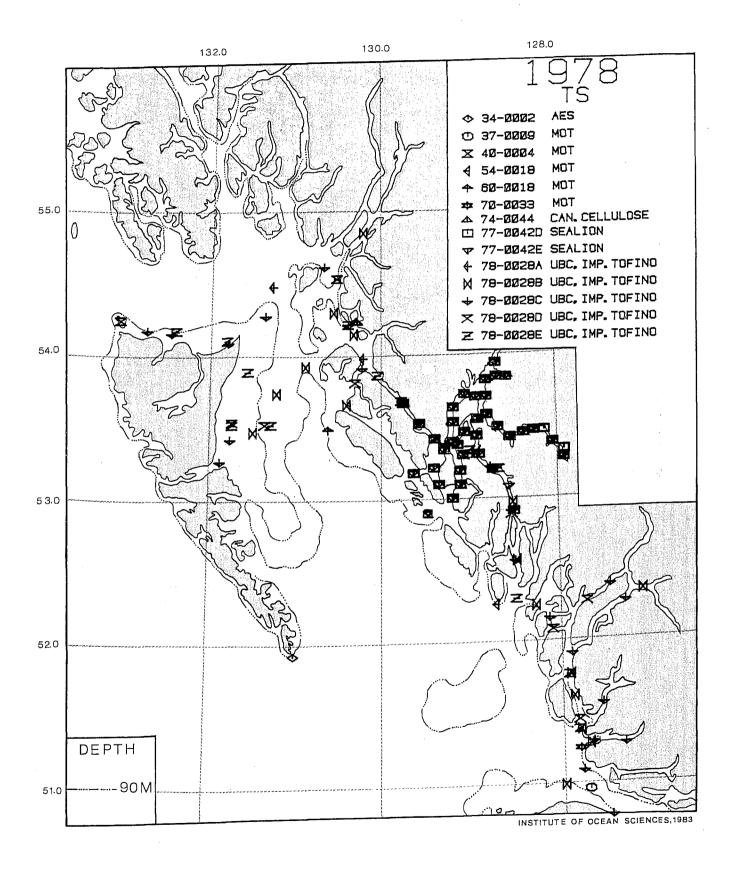


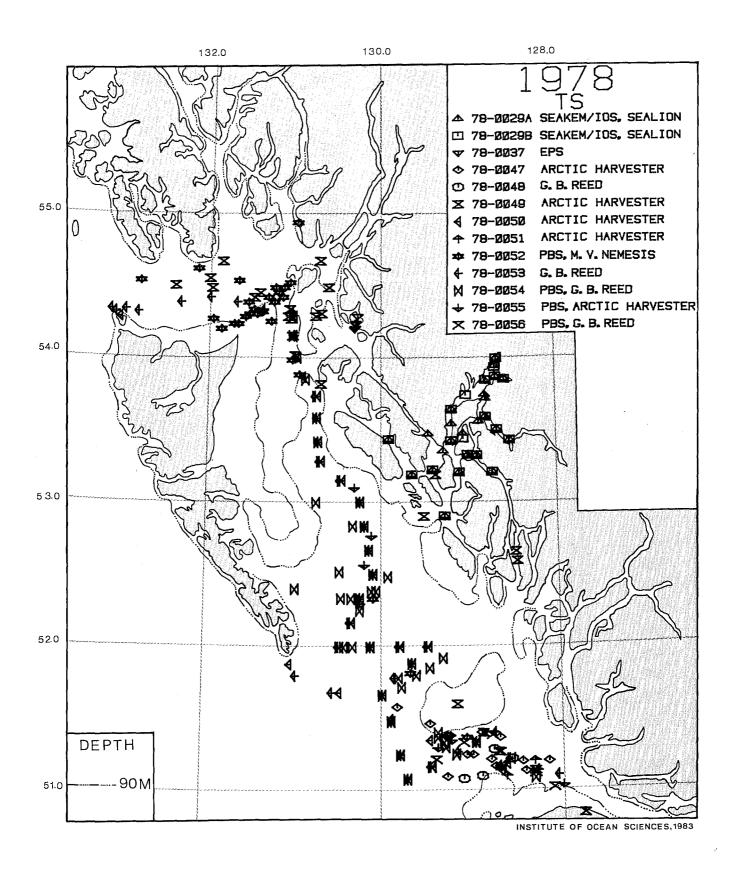


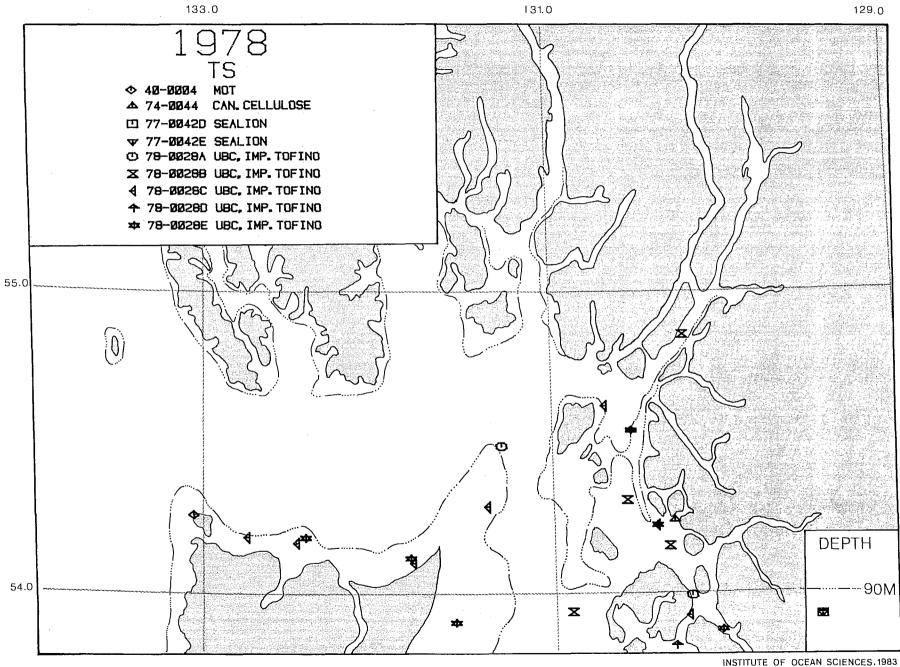


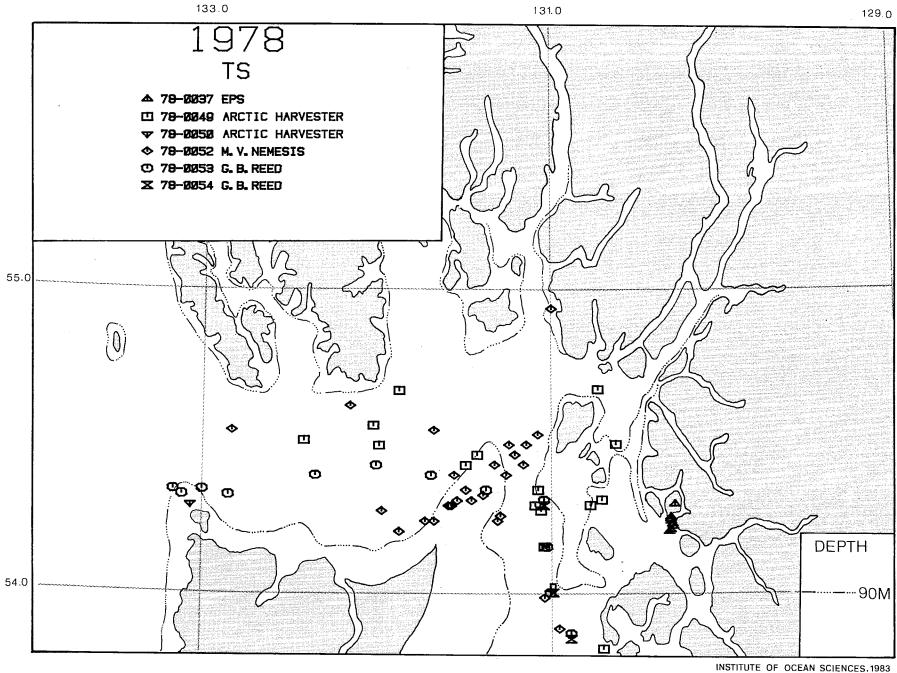


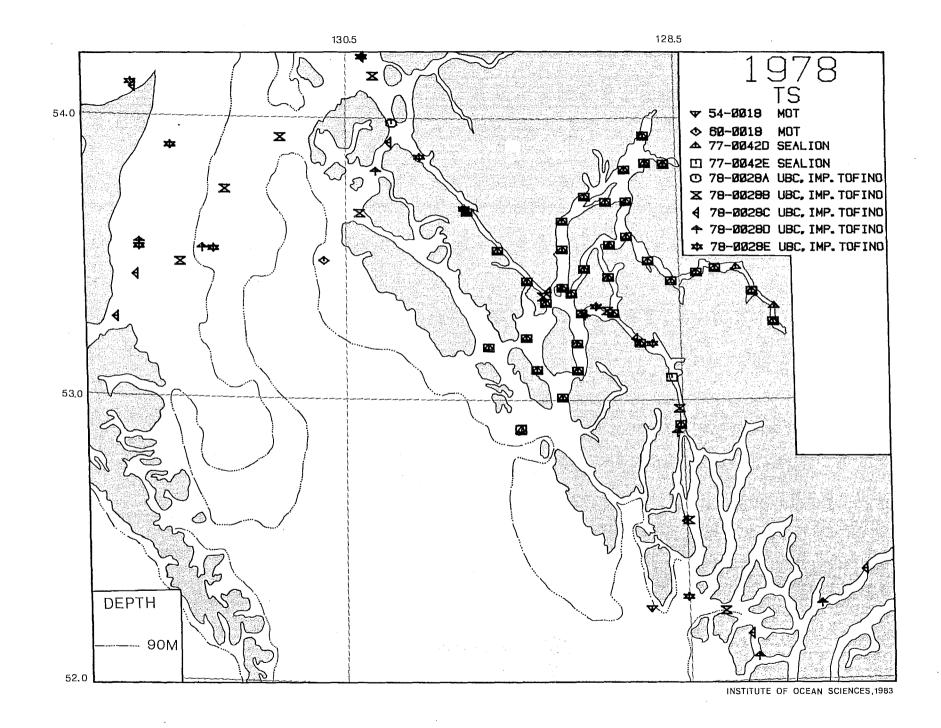


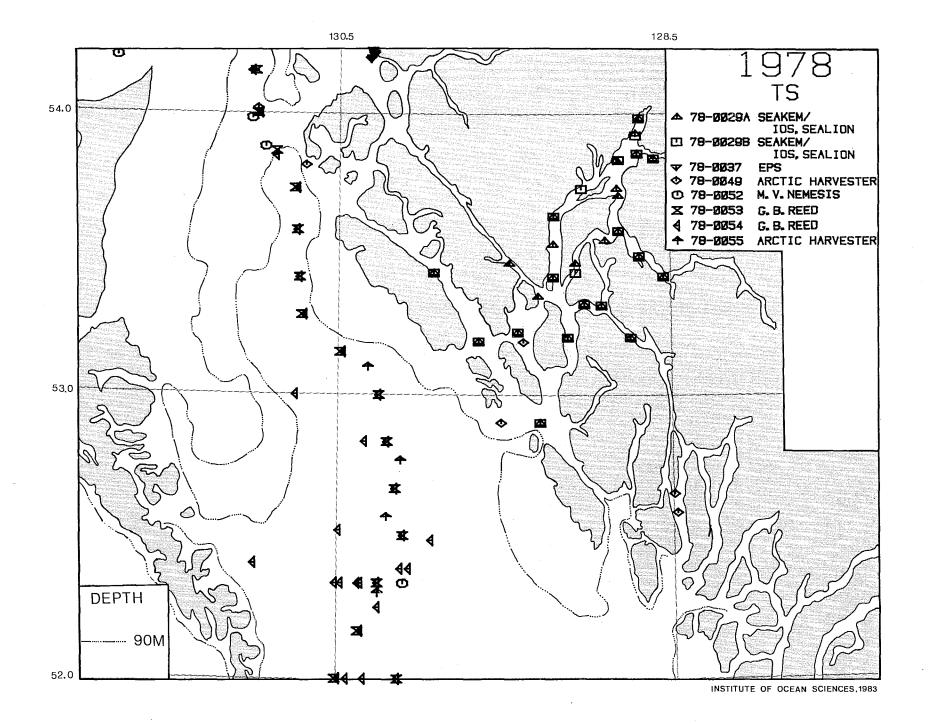


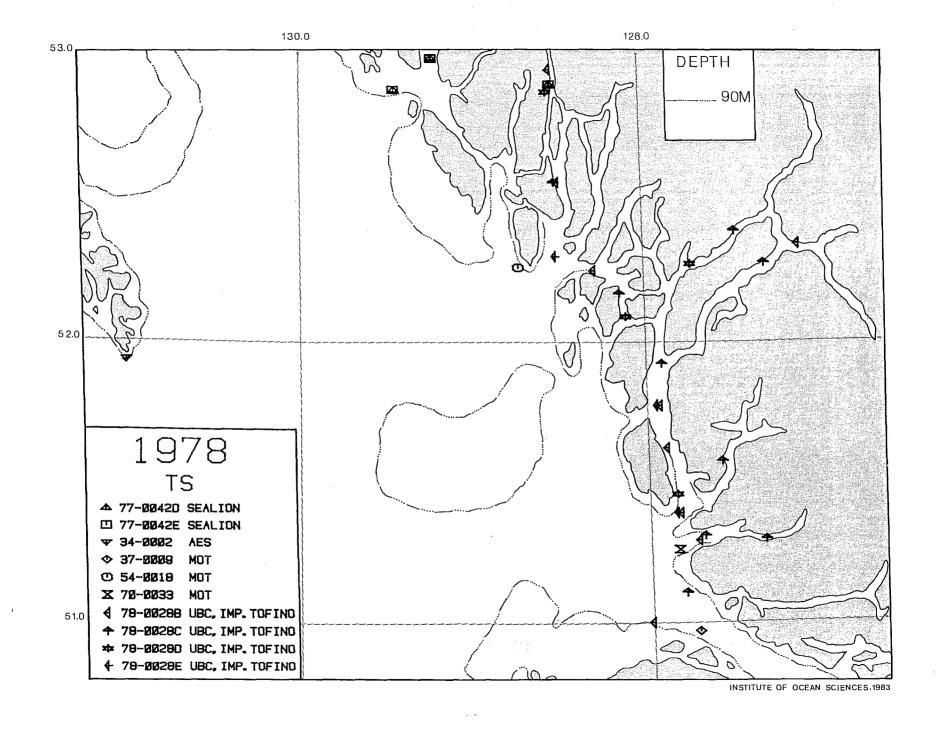


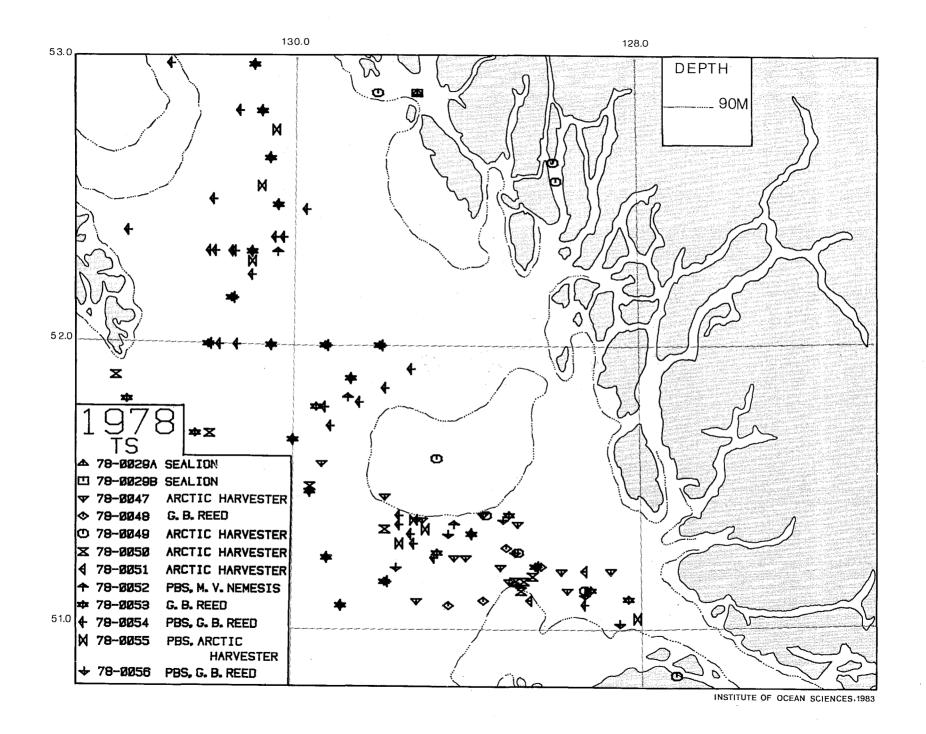


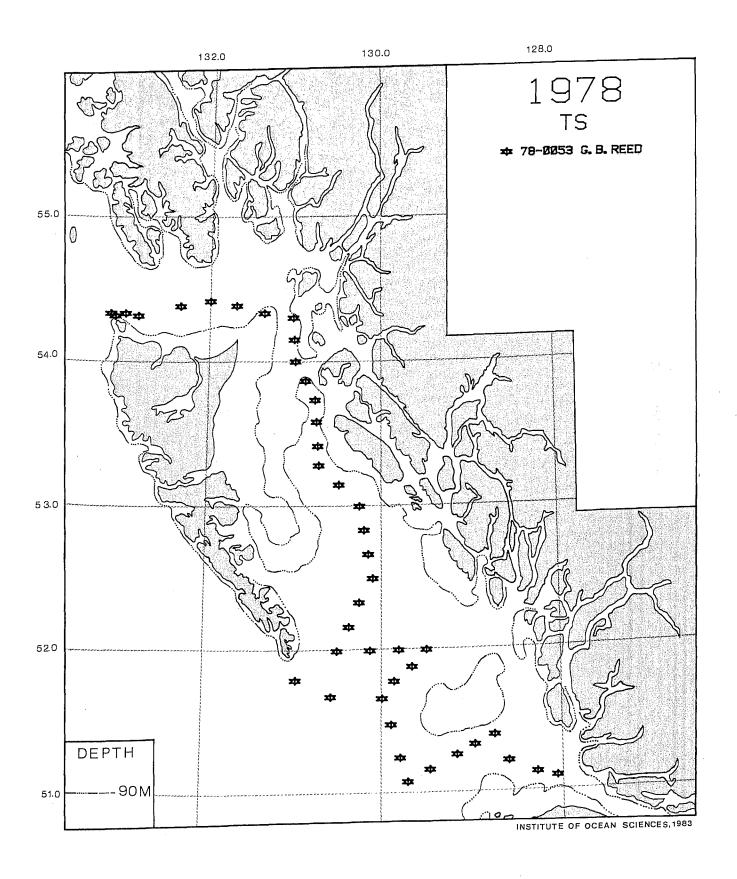


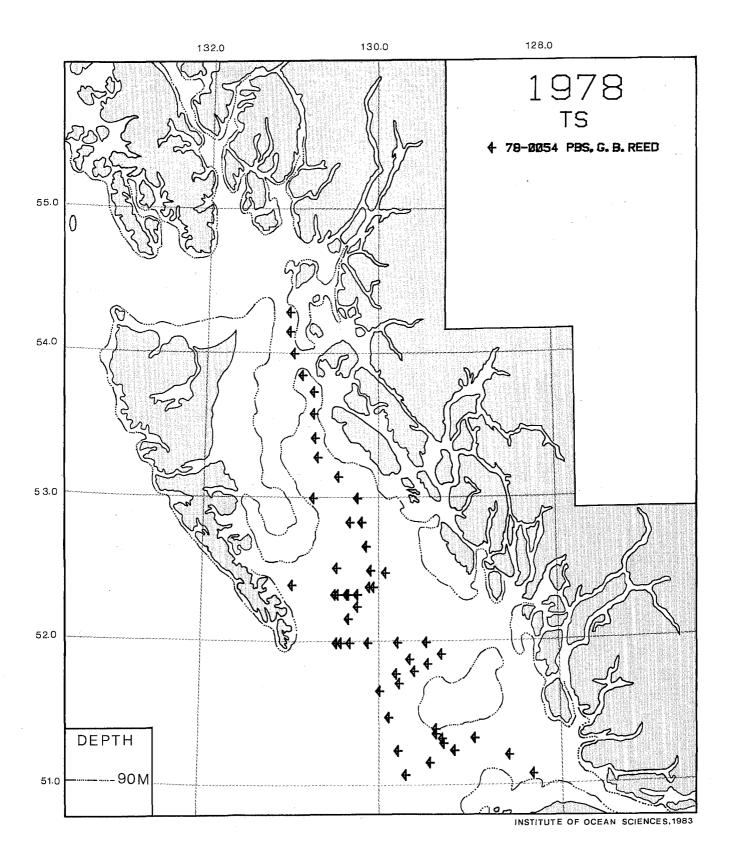


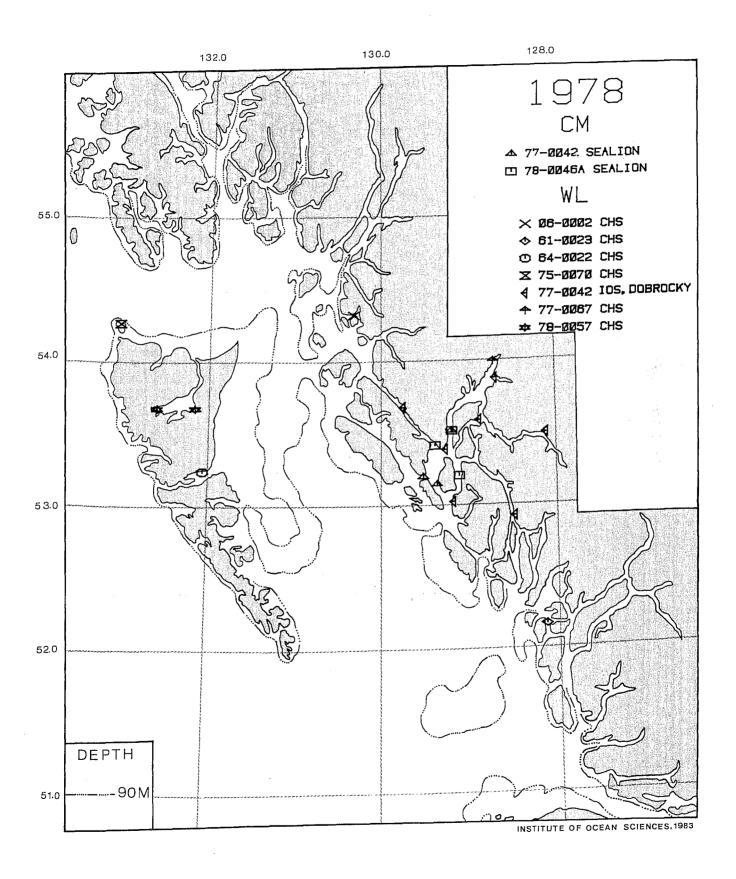


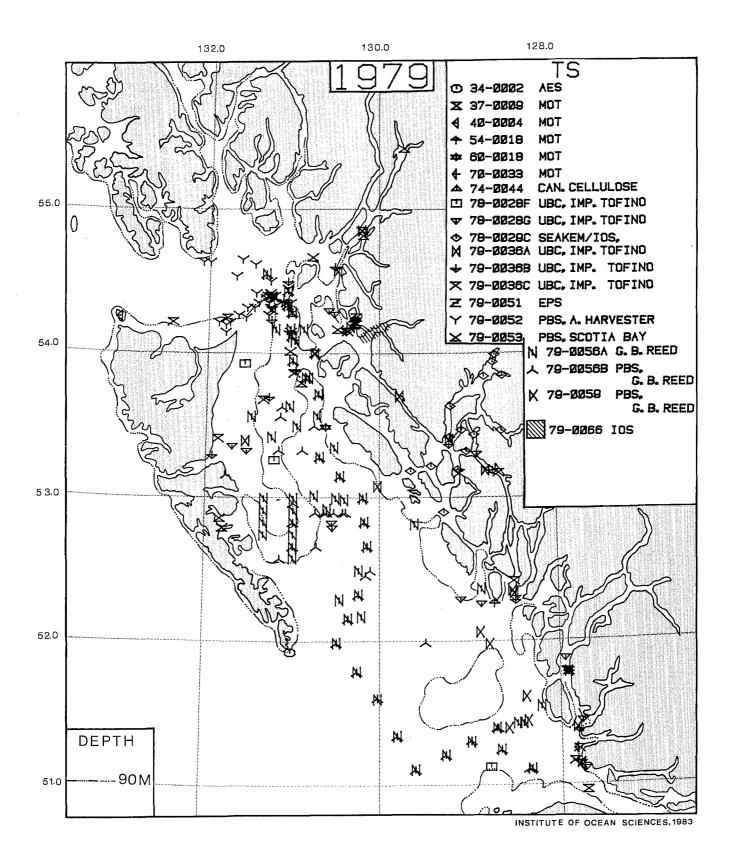




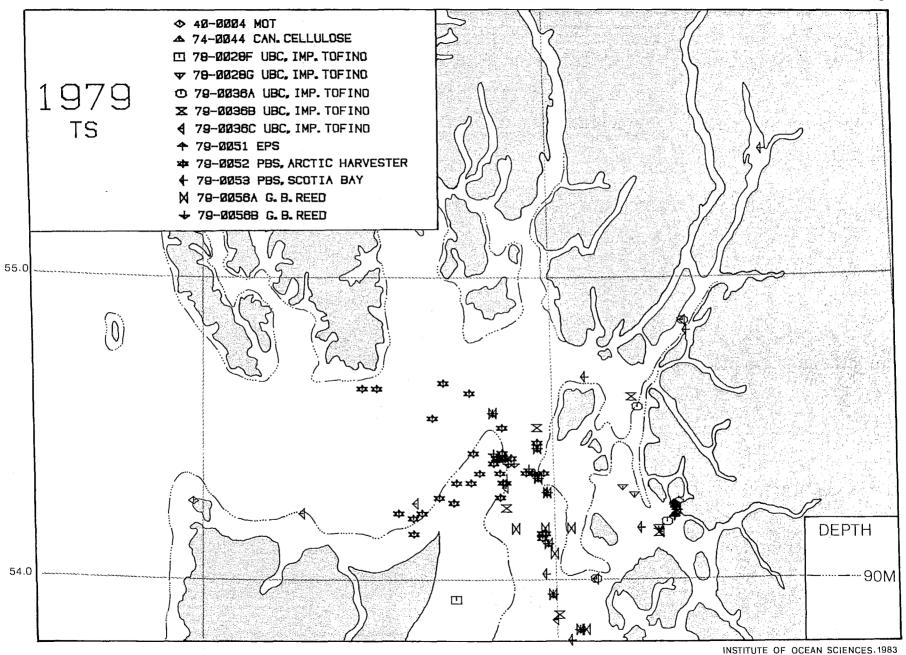


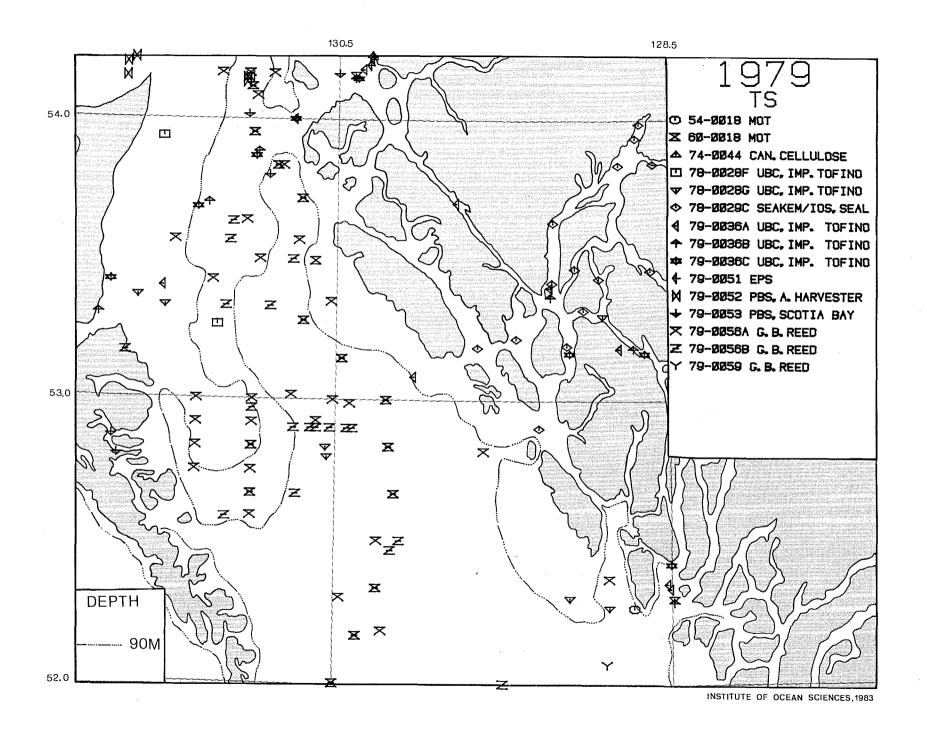


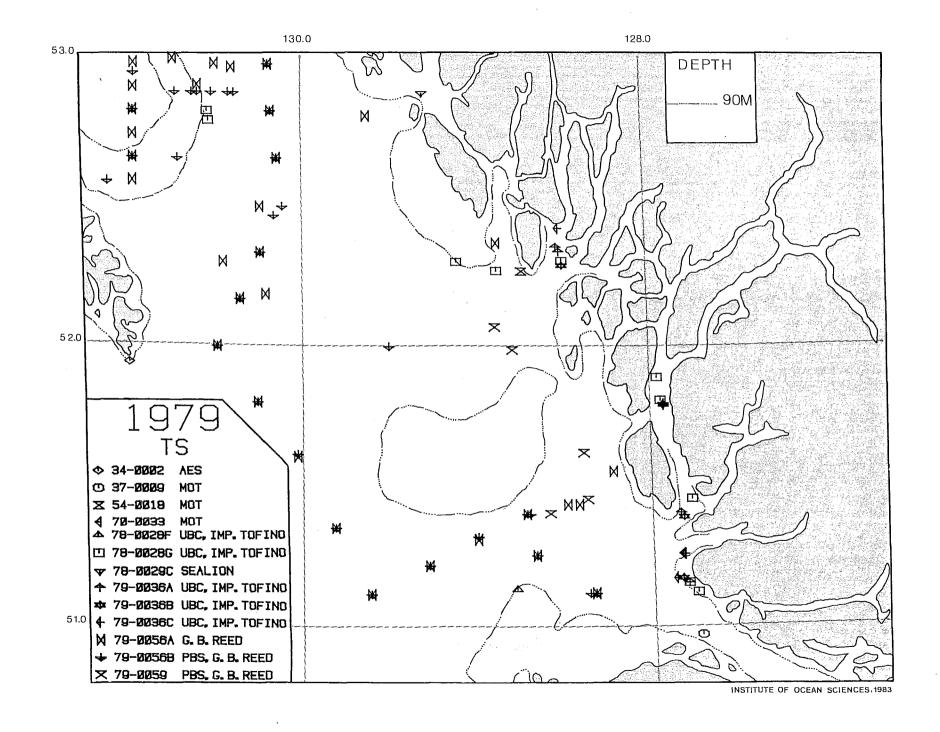


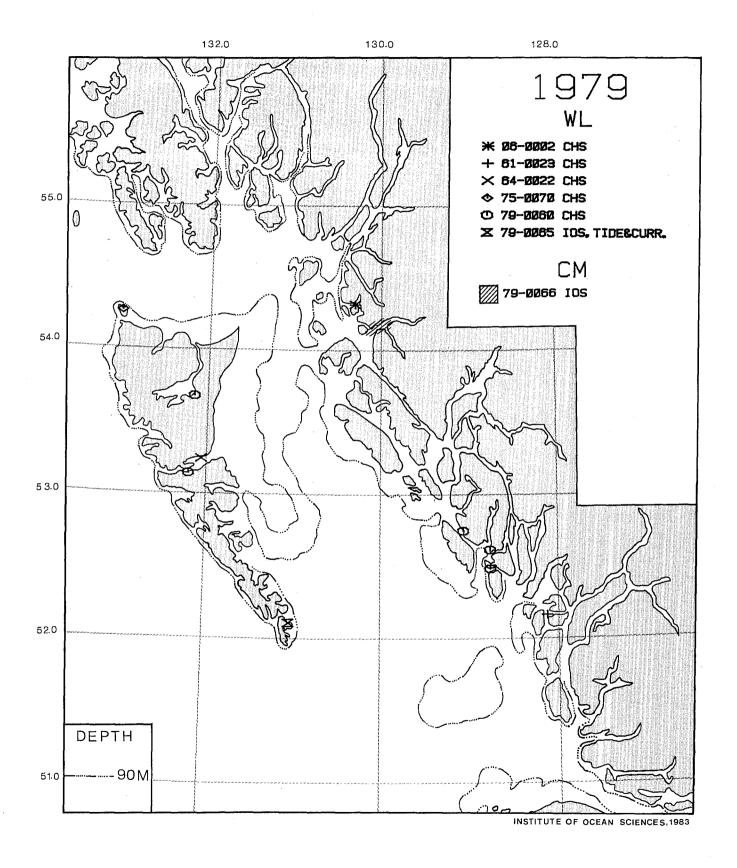


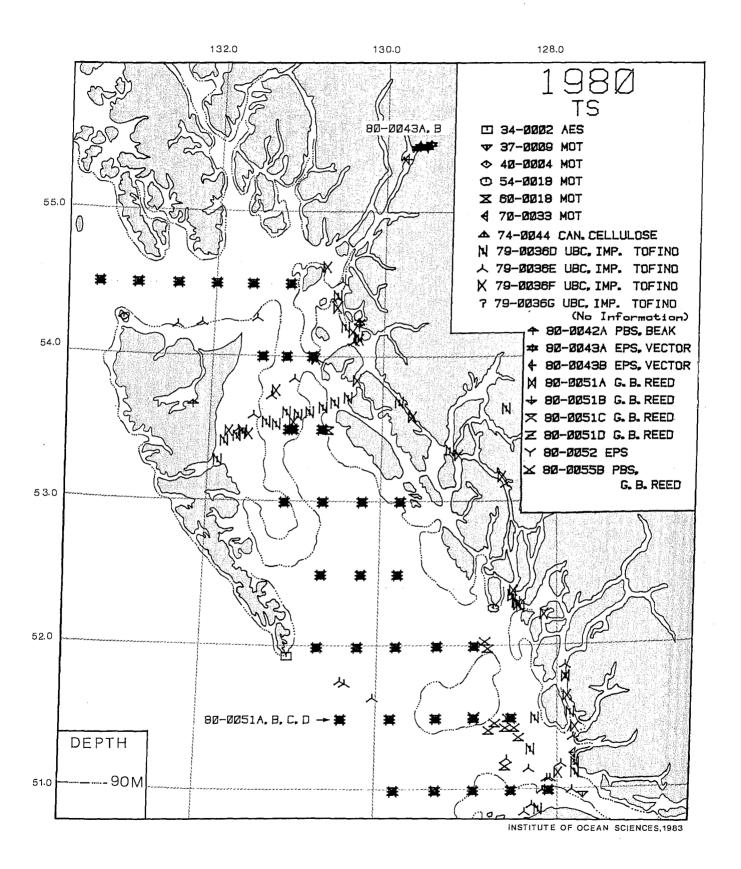


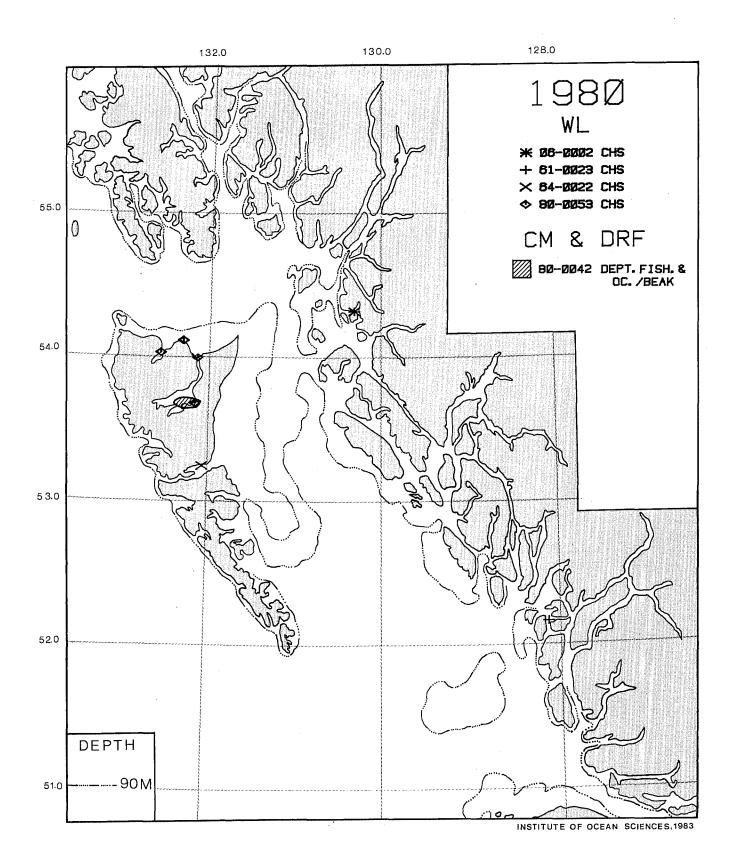


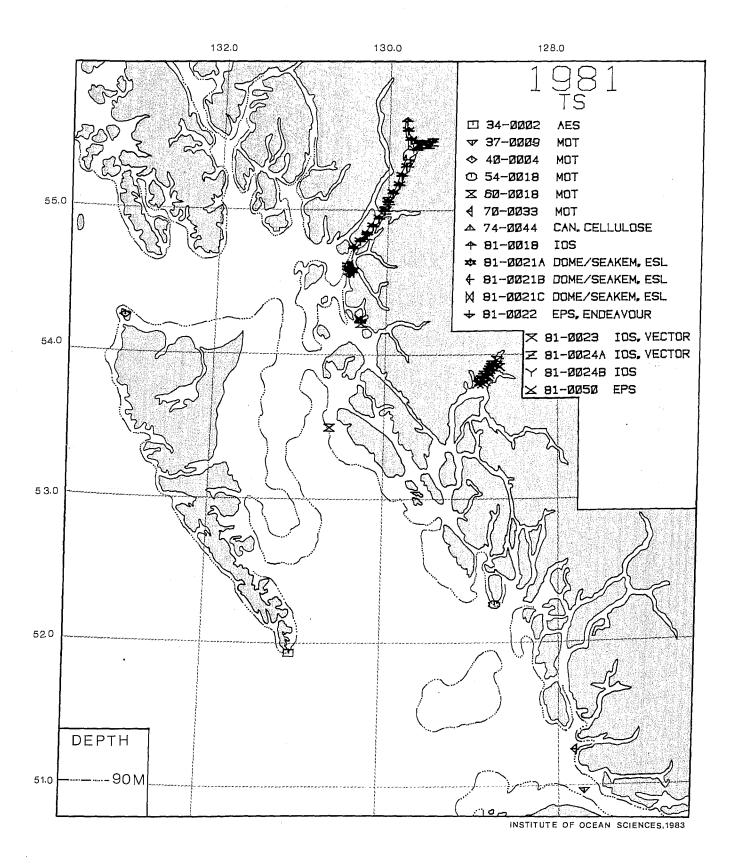


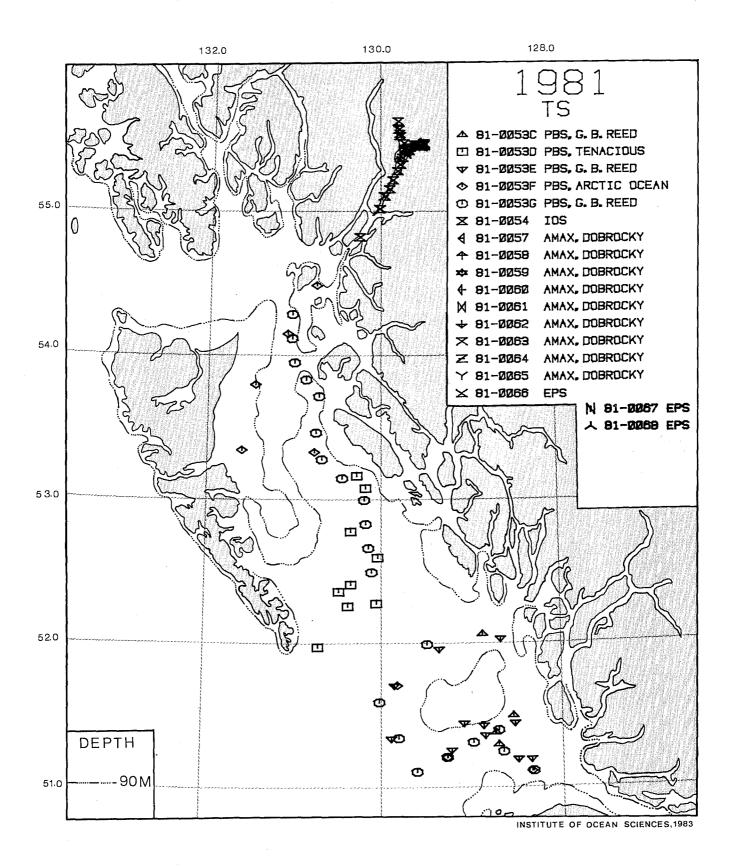


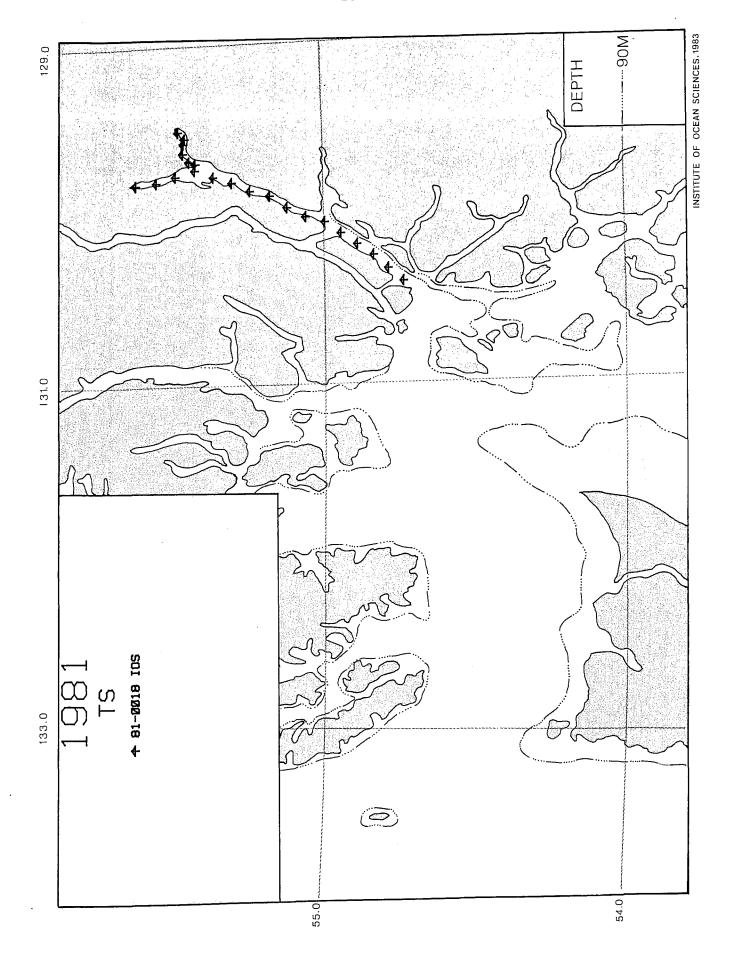


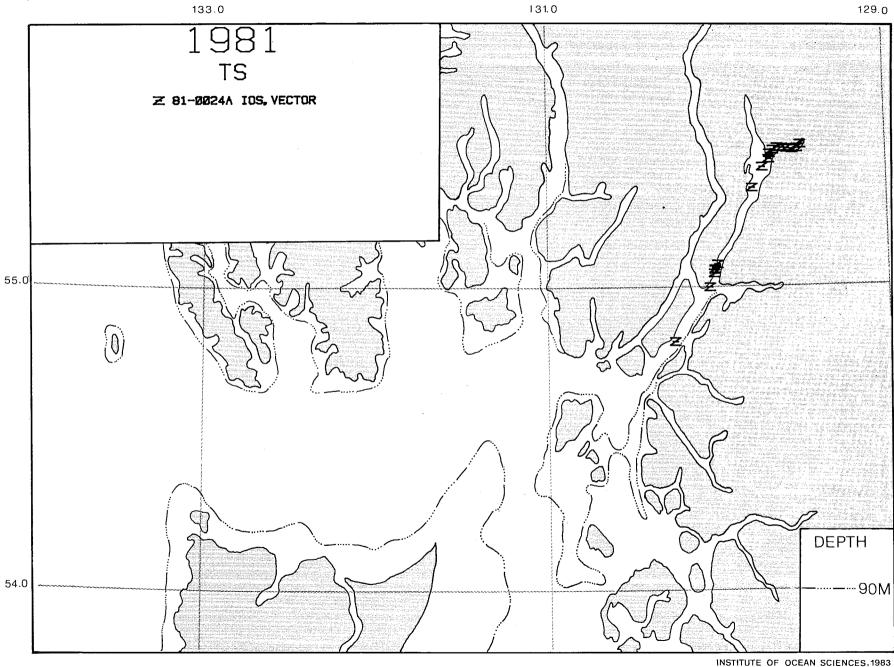


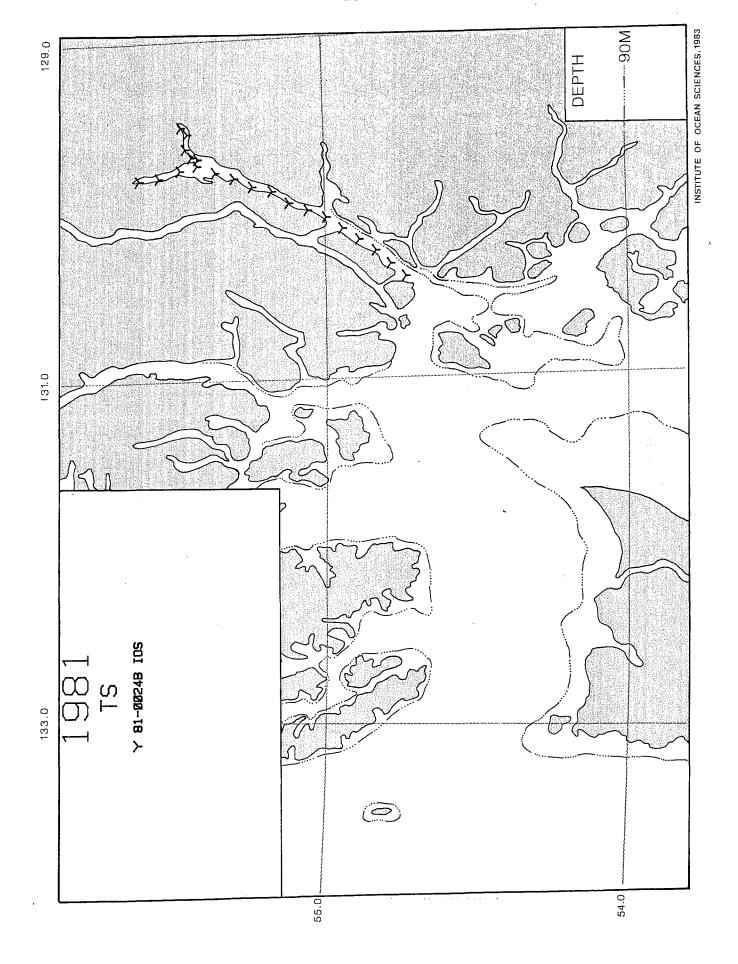


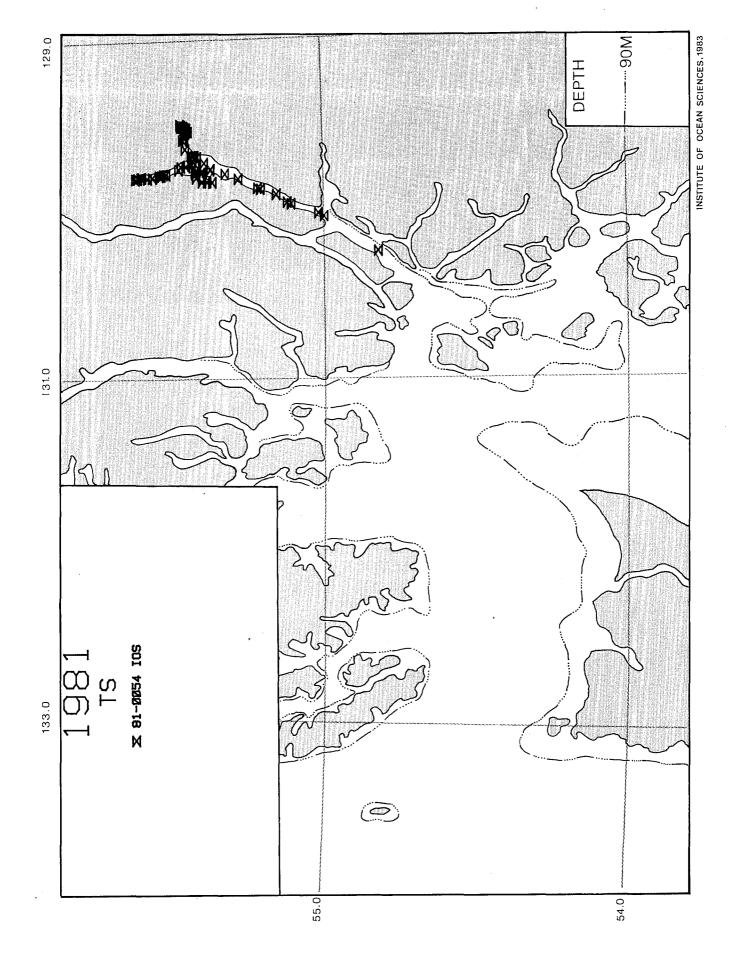


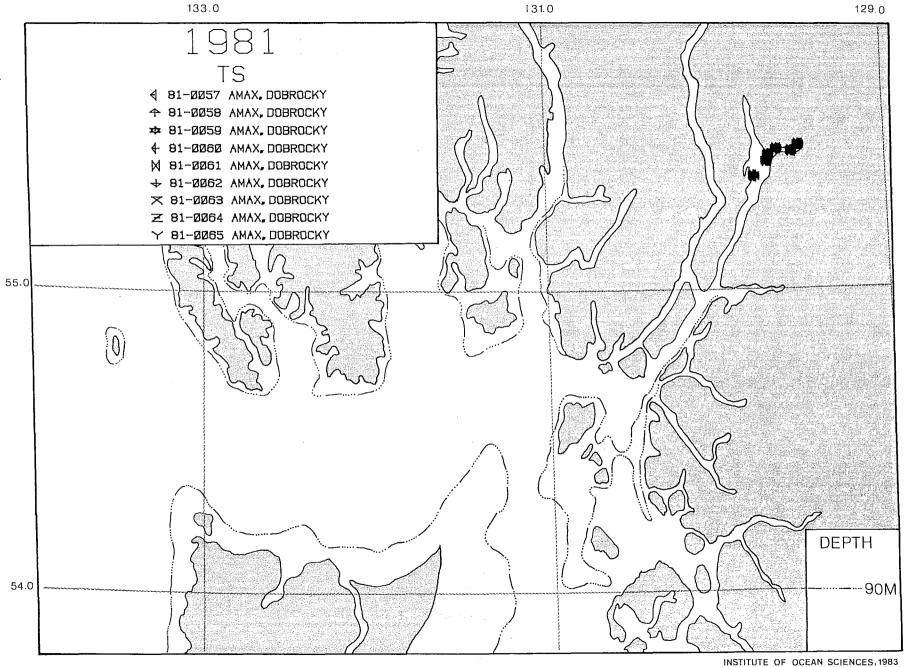


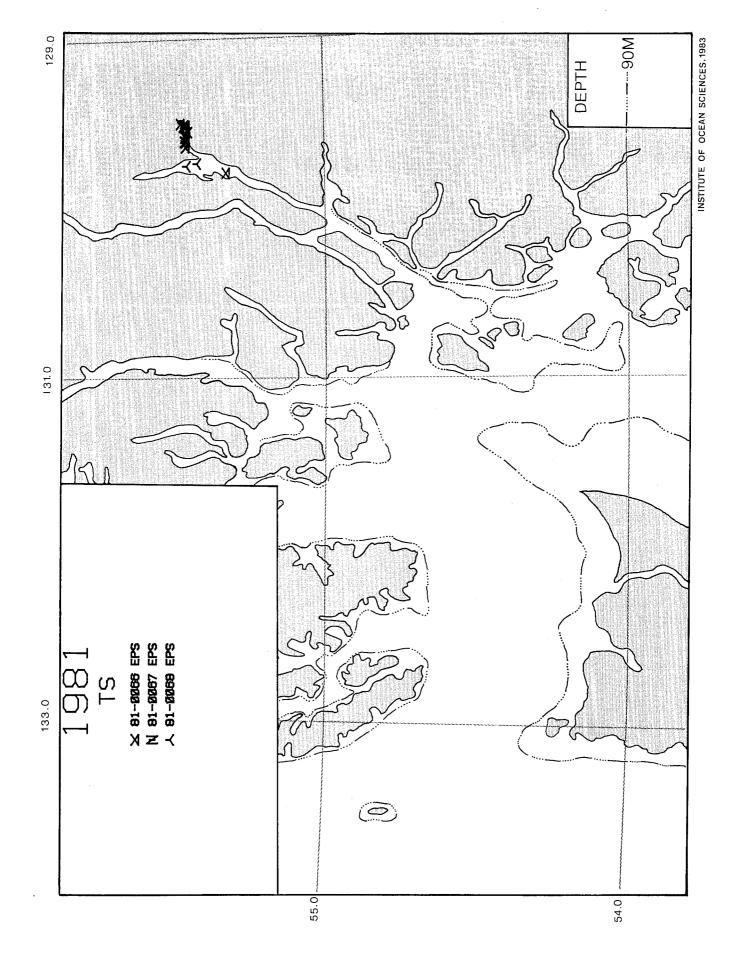


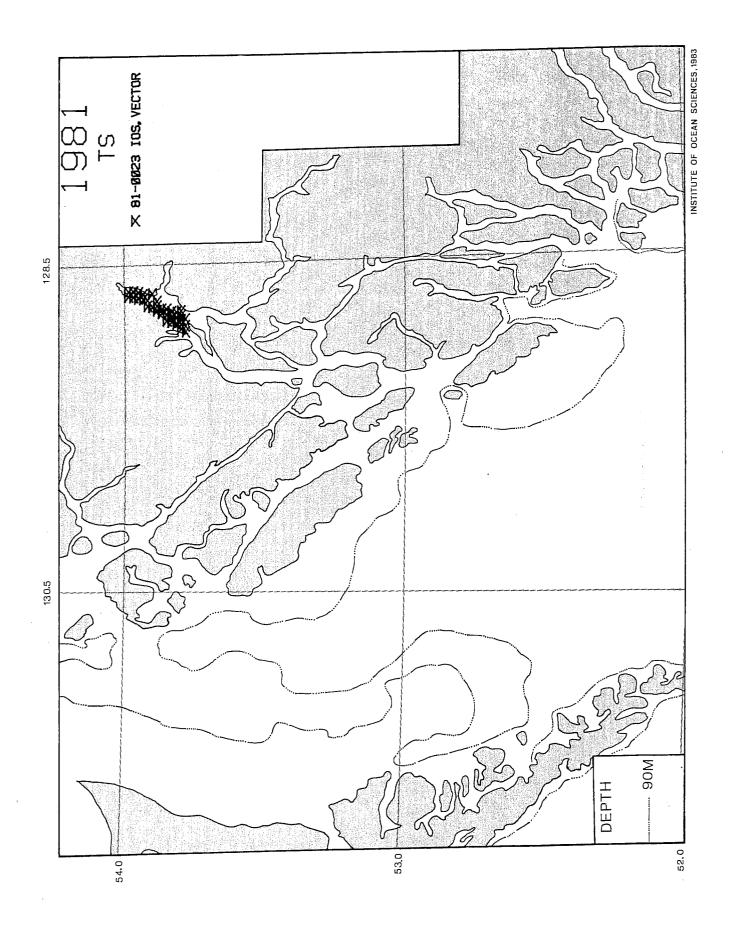


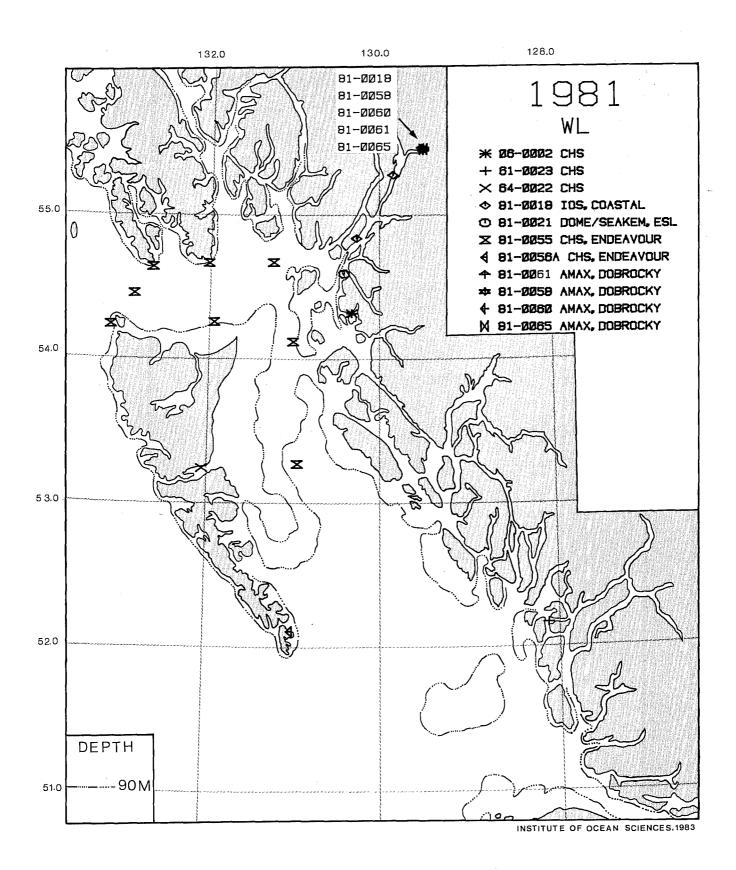


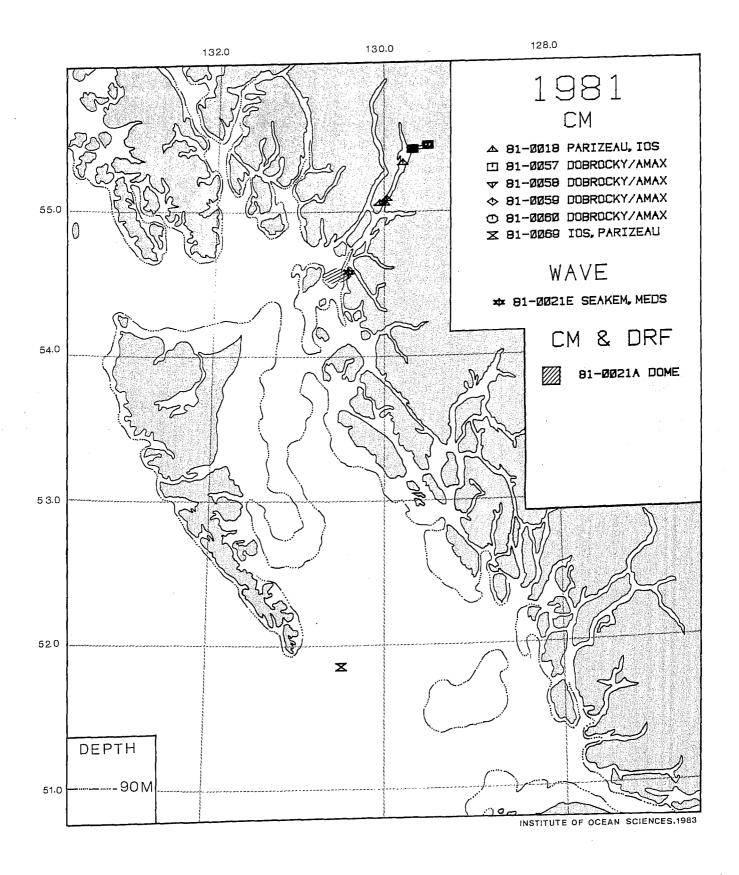


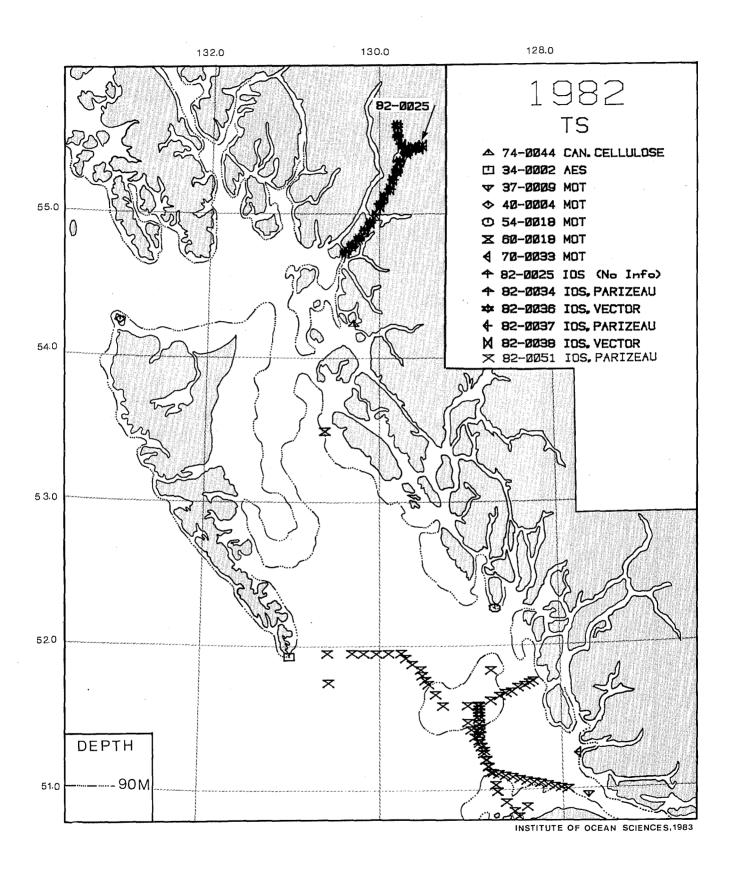


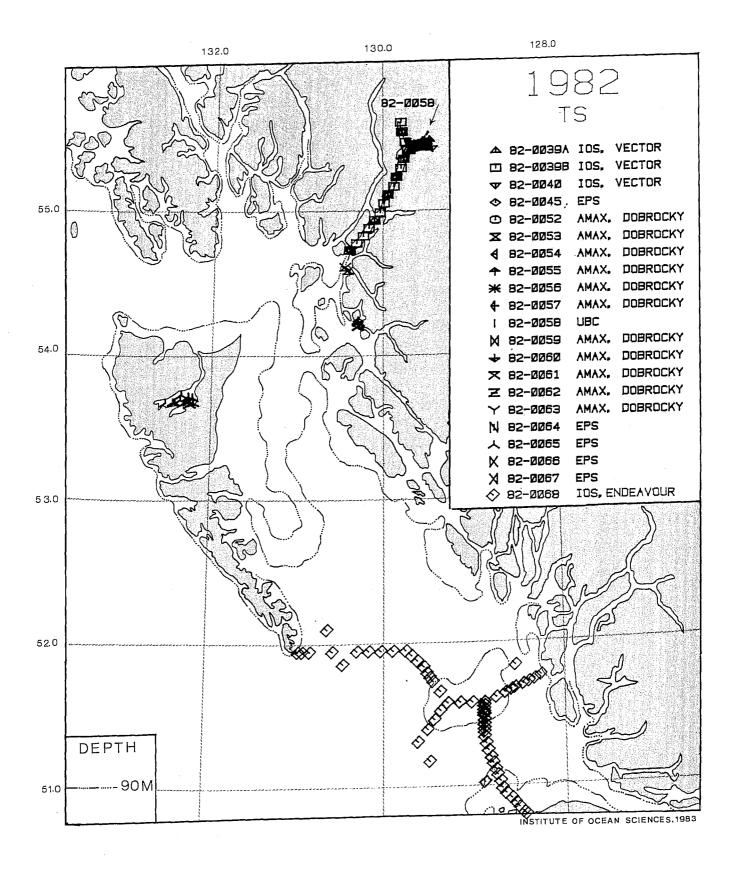


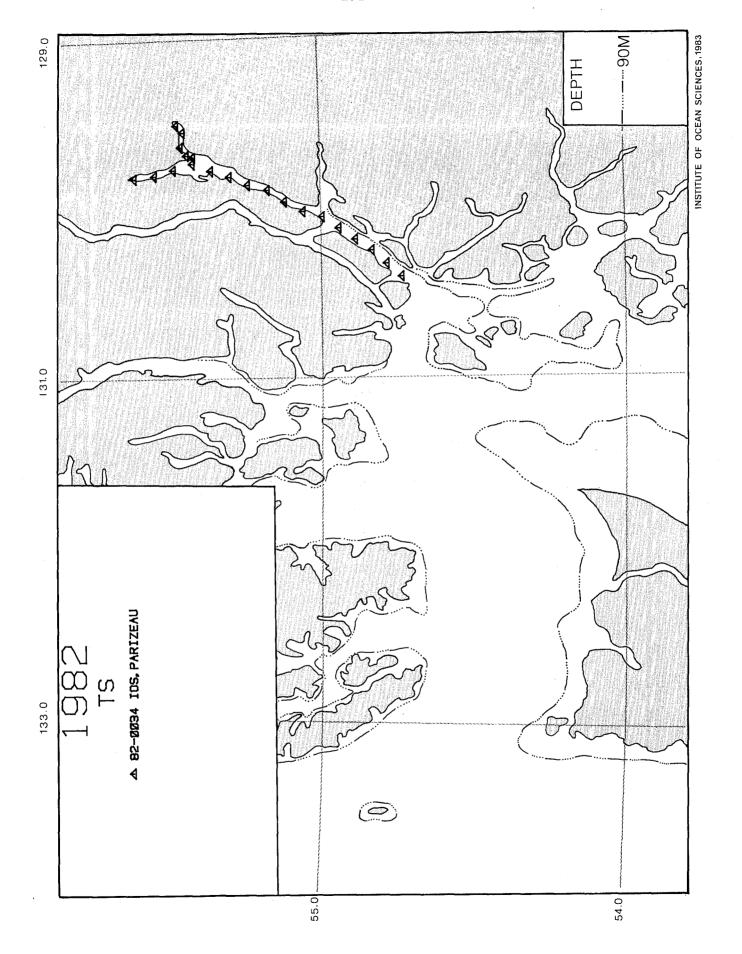


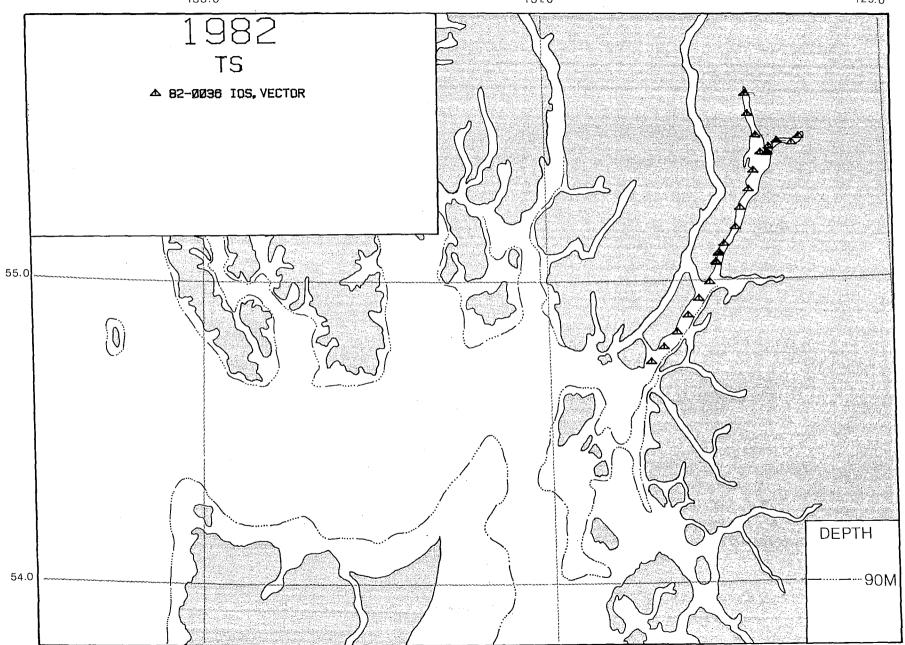




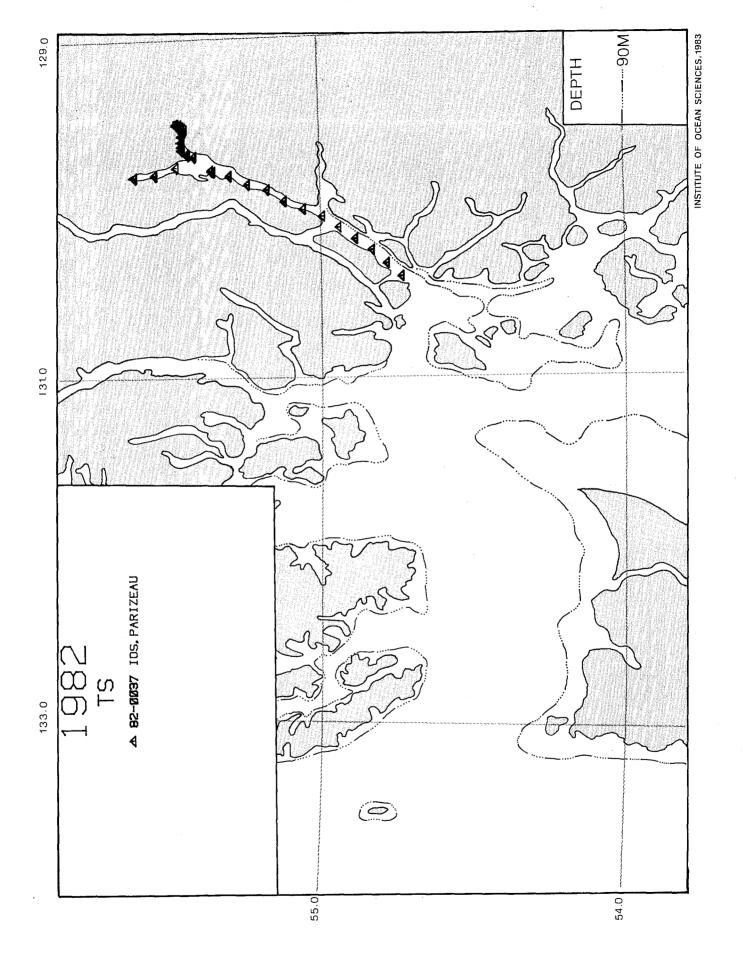




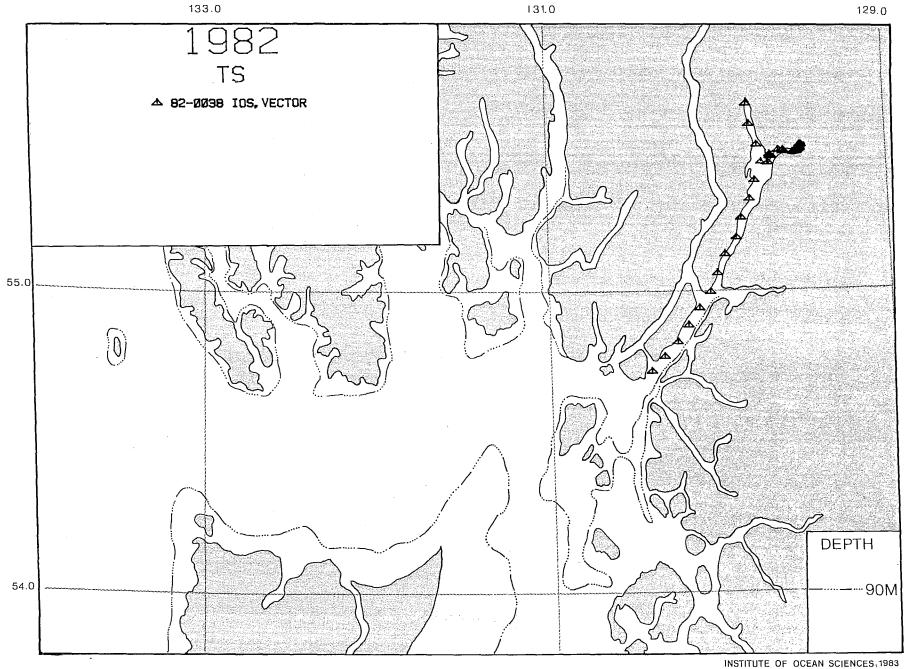




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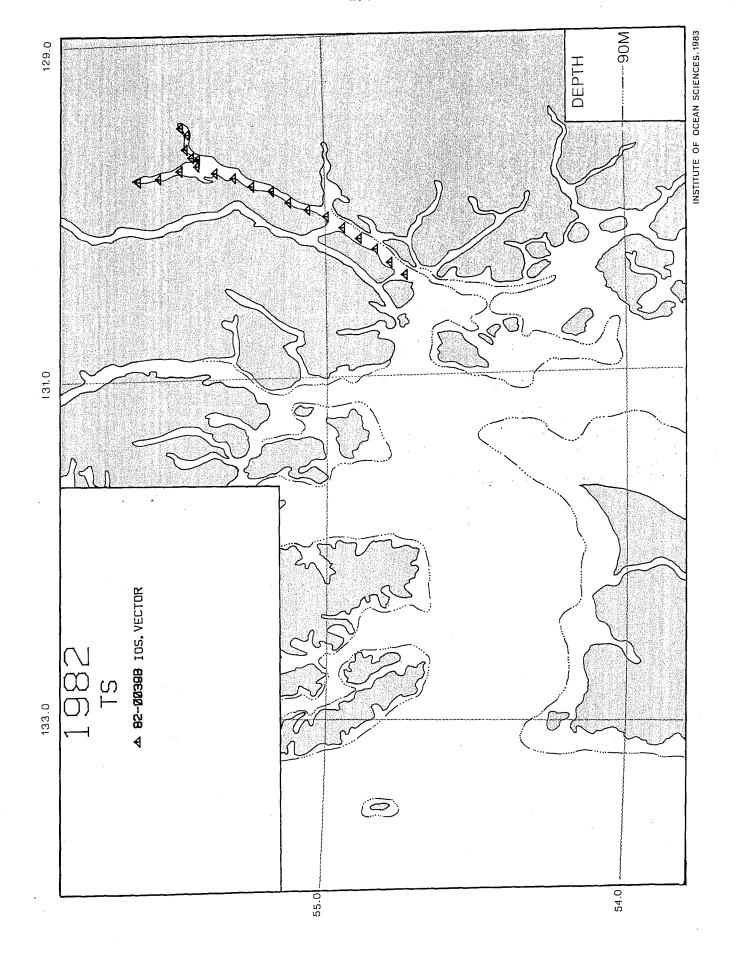


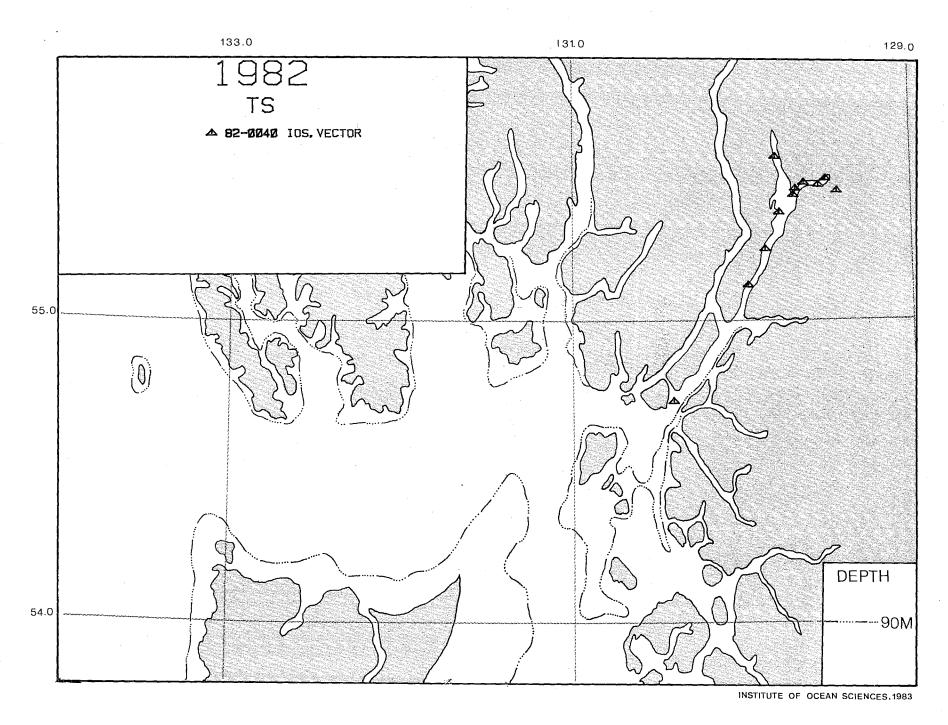


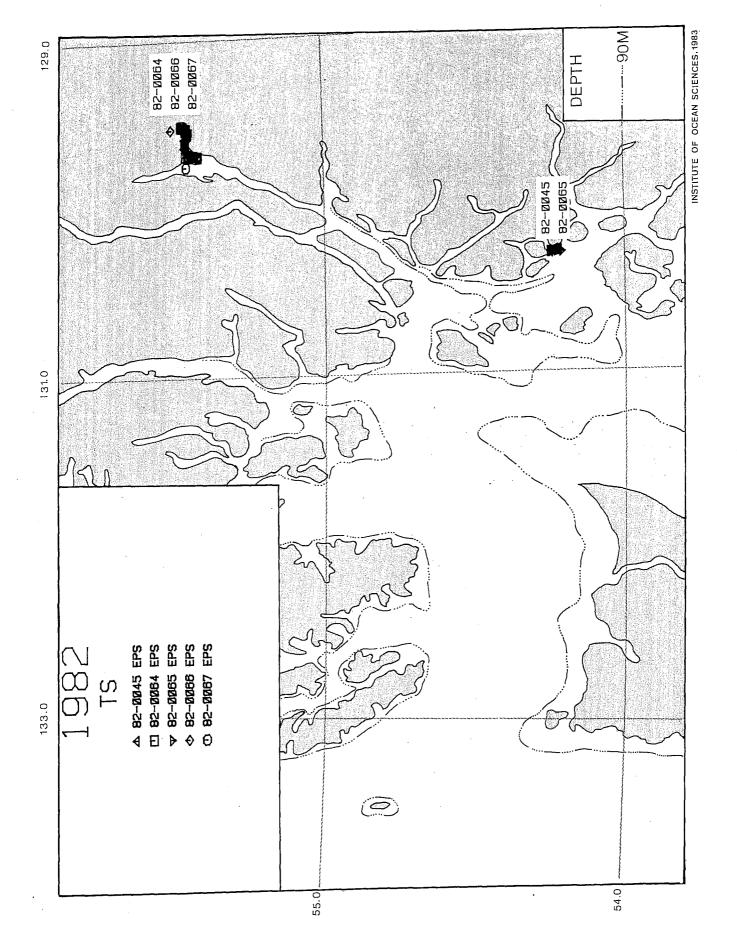


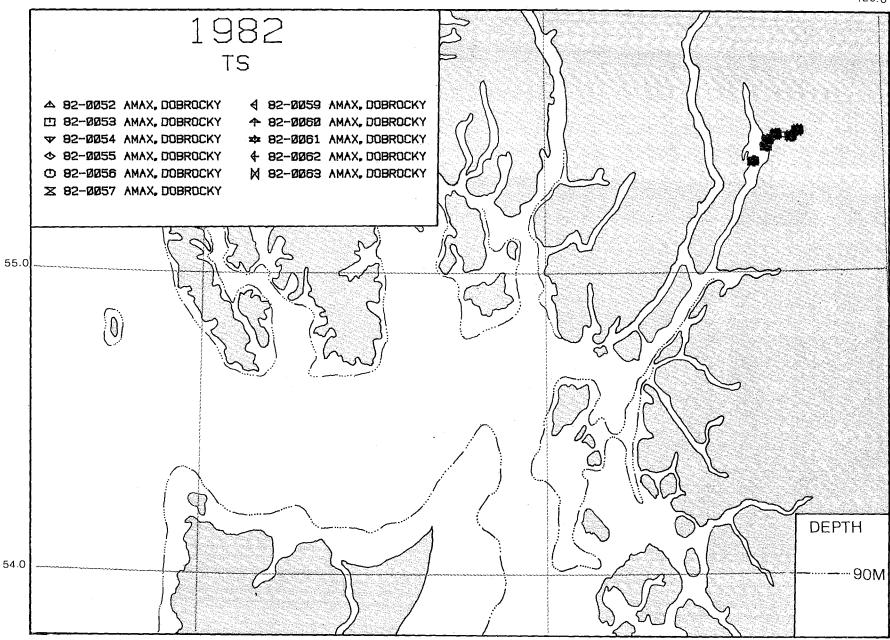
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