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No. 34

E. L. Bousfield and
Norma E. Jarrett

STATION LISTS OF MARINE BIOLOGICAL EXPEDITIONS
OF THE NATIONAL MUSEUM OF NATURAL SCIENCES
IN THE NORTH AMERICAN PACIFIC COASTAL
REGION, 1966 TO 1980



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ABSTRACT

Station data and locality maps are provided for marine biological expeditions of the National Museum of Natural Sciences in the following regions of the Pacific coast of North America: Washington and Oregon, 1966; Vancouver Island, B.C., 1970, 1975, 1976, 1977, 1978; British Columbia Mainland, 1975, 1976, 1977; and southeastern Alaska (Sitka region), 1980. These station lists combined with previous regional stations lists (1955-1964), provide basic locality and ecological data for current monographic studies of selected crustacean groups and other invertebrate taxa for which the expeditions were designed.

RESUME

L'auteur fournit ici une description des stations de collecte des expéditions de biologie marine du Musée national des sciences naturelles sur la côte du Pacifique d'Amérique du Nord et les localise sur des cartes géographiques comme suit: Washington et Oregon, 1966; île de Vancouver, C.-B., 1970, 1975, 1976, 1977, 1978; Colombie-Britannique continentale, 1975, 1976, 1977; sud-est de l'Alaska, région de Sitka, 1980. Ces listes de stations de collecte, en plus des listes régionales précédentes (1955-1964), constituent une source de données de base sur l'écologie de ces lieux dans le cadre d'études monographiques actuellement en cours sur des groupes précis de crustacés et autres invertébrés.

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INTRODUCTION

Since 1955, the National Museum of Natural Sciences has conducted marine biological investigations on the Pacific coast of Canada and adjacent shores of the United States to obtain study material and basic distributional-ecological information on crustaceans, mollusks, and other invertebrate taxa from this little studied region. Previously published are the station data for museum expeditions to Vancouver Island and southern coastal mainland British Columbia (Bousfield, 1958a), Queen Charlotte Islands and northern Vancouver Island (Bousfield, 1963), the central mainland coast of British Columbia (Bousfield, 1968) and southeastern Alaska and Prince William Sound (Bousfield and McAllister, 1962). Herewith are presented station data for expeditions to the coastal marine regions of Washington and Oregon, 1966; Vancouver Island, 1970, 1975, 1976, 1977, and 1978; the southern British Columbia mainland, 1975, 1976, 1977; and the Sitka region of southeastern Alaska, 1980.

Publication of station lists is designed to avoid duplication of raw data and map figures where multidisciplinary publications are anticipated (e.g., Bousfield and Laubitz, 1972). Collections of the National Museum of Natural Sciences from the North American Pacific coastal region (since 1955) have already provided bases for publications on regional semi-terrestrial and freshwater amphipods (Bousfield, 1958b, 1958c) and the marine amphipod families Atylidae and Oedicerotidae (Mills, 1961, 1962), Podoceridae (Laubitz, 1977), and Caprellidae (Laubitz, 1970). Present station collections, combined with earlier material, are incorporated in regional monographic studies of amphipod superfamilies and families that include the Gammaroidea (Bousfield, 1979a), Ampeliscidae (Dickinson, 1981, in press), Ampithoidae and Aoridae (Conlan and Bousfield, 1981a, b, in press), Lysianassidae (Jarrett and Bousfield, 1981, in press) and selected families of Talitroidea (Bousfield 1979b, 1981a, b, c, in press, Bousfield and Tzvetkova, 1981 in press). Non-amphipod material has been included in regional studies of isopod crustaceans (Rafi, 1972), mysid shrimps (Holmquist, 1973, 1978, 1980), decapod crustaceans (Hart, 1968, 1971, 1980, and Butler, 1980), mollusks (Clarke, 1972), and fishes (Gruchy, 1970, McAllister, 1968, Peden, 1978, and Peden and Wilson, 1976). Extensive material of other gammaridean superfamily groups, cumaceans, tanaids, isopods, nebaliceans, and representative material of other invertebrate groups including sponges, coelenterates, polychaetes, and chordates (e.g., Ascidiacea) await study by interested systematists.

Methodology

As in past expeditions, the majority of collecting stations were intertidal and shore based, and within hip-boot reach at low tide.



Fig. 1. Student class, Bamfield Marine Station, on flat sand beach at Pachena Bay, Vancouver Island, B.C.



Fig. 2. Student and crew of R/V LEIK, Bamfield Marine Station, operating dredge.

Specimens were obtained by means of hand nets, shovel and sediment screens, handpicking, and washing of algal fronds, hold-fasts, and eelgrass roots. Previously, collections were formalin-preserved in the field. Since 1975, however, specimens (and part of their substrata) have been stored in cold sea water in plastic vials, jars, and brought back alive to the laboratory. There they have been screened and sorted, and the animals observed for basic behaviour patterns and photographed in living colour. Limited sampling of subtidal, infaunal and sediment-burrowing communities was attempted at regional shipboard stations (Figs. 1-6). On larger vessels such as the R/V VECTOR, ACTIVE LASS, and LEIK (Bamfield Marine Station), various types of dredges and bottom trawls, and grab samples (Ponar, Ekman) were employed with varying success. A simple light Naturalist's dredge manufactured by Turtox Co. (Rochester, N.Y.) with protected coarse-mesh nylon bag, proved most effective for collecting small infaunal crustaceans on sand or silty sand, in depths up to 30 metres, when towed either from a light outboard-powered craft, or from the larger vessels. Collected samples were quickly washed down on special sorting tables, or elutriated in large overflow tubs, from which the animals were screened, concentrated, and maintained in cold seawater containers. Plankton samples were obtained from surface waters using standard metre hoops and coarse nylon mesh nets.

In order to produce realistic colour on film, animals must be photographed alive since natural colours fade extremely rapidly after death. Major problems encountered in handling small to medium-sized animals (2-20 mm in body length) were (1) "freezing" the animal in a natural position, despite body movements and extraneous vibrations, (2) illuminating the subject sufficiently, yet allowing appreciable stoppering down of the lens diaphragm to give reasonable depth of field at high magnifications, and (3) keeping the animal, water, and dish free of mucus, dirt, and other extraneous material. In solving these problems, various forms of high speed synchro-flash photo equipment were used, including the Nikkormat FT-2 and medical lens, and the Wild M-5 stereo binocular microscope and photo attachments, especially for high magnifications. Until the methodology is published, details may be obtained through direct contact with the senior author and/or Mr. Ron Long, Department of Biology, Simon Fraser University.

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Fig. 3. South end of Long Beach, Wickaninnish Bay, Vancouver Island, B.C.



Fig. 4. Skipper Sig Tveit emptying trawl aboard R/V LEIK, Bamfield Marine Station.

Bourne; the Pacific Environmental Institute, West Vancouver, B.C., and staff members Drs. Michael Waldichuk, Colin Levings, Messrs. Neil McDaniel, Len Bell, and Graham Christie, Ms. Penny O'Rourke, Captain Sandy Matheson and crew of the R/V ACTIVE LASS and Captain Marsden and crew of the R/V VECTOR; the National Parks Service, Pacific Rim National Park, B.C.; the British Columbia Provincial Museum, Victoria, B.C., including Dr. Alex Peden, Phillip Lambert, and the late Dr. G. Clifford Carl and his wife Babs (Dr. J. F. L. Hart); the University of Victoria, especially Dr. Derek V. Ellis; the Bamfield Marine Station including Director, Dr. John McInerney, Drs. Louis Druehl, Ian Lawn, and Andrew Spencer, Myriam and Cliff Haylock, students Lynn Daniel, Darlene Switzer, Wendy Craik, and Bruce Leaman, and skipper Sig Tveit and crew of the R/V LEIK; and the Friday Harbor Marine Laboratory (University of Washington), especially Dr. Paul Illg, Dr. Charles O'Clair, and Mr. Craig Staude. Individuals who gave unstintingly of their time and interest to various phases of the field surveys include fellow museum staff members Fahmida Rafi, Peter Frank, and Dr. Rita O'Clair, post-doctoral fellow John Dickinson and research associate Kathleen Conlan; Mr. Ron Long, Simon Fraser University, and Ms. Marilyn Allan of Toronto, Mrs. Cynthia Mutch, University of Alberta, David and Floy Zittin, Vancouver, Dr. Wm. Austin, Pender Harbour, B.C., Mr. John Eilertson, Coal Harbour, B.C., Dr. Clem Pelletier, Utah Mines, Port Hardy, B.C., Dr. John Morton, Auckland, New Zealand, Mr. and Mrs. Richard Billings, Southeast Alaska Cruises, Inc., Sitka, Barbara and Marjorie Bousfield and others too numerous to mention here. To all these agencies and persons, the authors extend their sincere thanks.

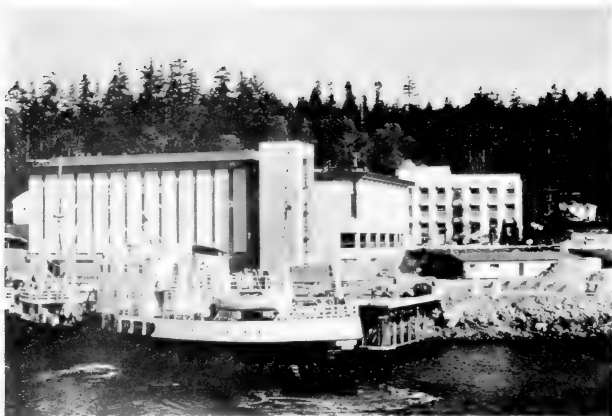


Fig. 5. Pacific Biological Station, Nanaimo, B.C., with R/V G.B. REED at dock.



Fig. 6. Technician Penny O'Rourke, Pacific Environmental Institute, operating Naturalist's dredge aboard R/V ACTIVE IASS.

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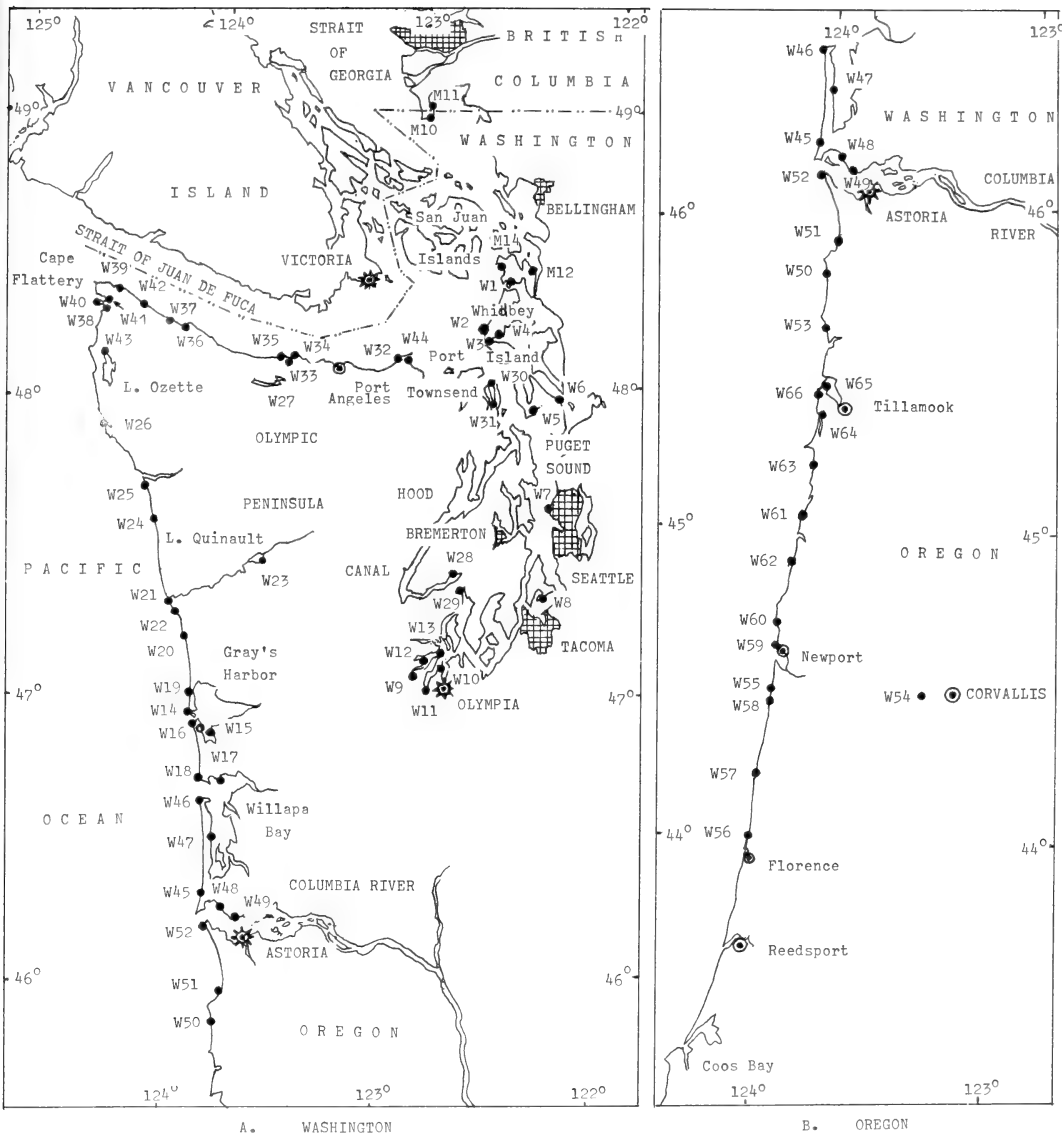


Fig. 7. Collecting localities in Washington and Oregon, 1966.

TABLE I. COLLECTING STATION IN WASHINGTON AND OREGON, 1966
(Collectors: E.L. Bousfield, Barbara Bousfield, Marjorie Bousfield)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. OC	SALTY o/oo	DEPTH & SAMPLING METHOD	HABITAT
W1	July 11	Washington Pass Lake Fidalgo I., Island Co.,	48°25'N 122°38'W	LW	18.8	FW	Dipnet	Gravelly sand, leaves and woody detritus at lake edge
W2	12	West Beach, Whidbey I., Island Co.	48°18'N	LW	12.4	30.4	Dipnet, hand picking	Fine to medium black sand; boulders, fucoids; LW-MW level
W3	12	Juan de Fuca Cove, head of Penn Cove, Whidbey I.	48°14'N 122°44'W	LW	12.6		Dipnet, hand picking	Black sand and gravel, clusters of <u>Mytilus</u> ; LW-MW levels
W4	12	Penn Cove, north shore opposite Coupeville, Whidbey I.	48°14'N 122°41'W	LW	12.5	22.6	Dipnet	Medium coarse black sand; eel grass; LW-1/3 R
W5	13	Useless Bay at Double Bluff, Whidbey I.	47°58'N 122°31'W	LW	14.8	27.1	Shovel, screen, hand picking	Fine to medium gray sand flats; stones, boulders, Ulvaceae; LW
W6	13	Sandy point, Saratoga Pass, Whidbey I.	48°02'N 122°22'W	LW	14.0		Dipnet, hand picking	Medium gray sand; filamentous algae, Ulvaceae; LW-sub-tidal
W7	14	Meadow Point, N. Ballard, King Co.	47°41'N 122°24'W	LW	12.8	29.4	Dipnet	Fine to medium sand, small stones, Zostera, Ulvaceae, epiphytic algae; LW-sub-tidal

W8	15	Summerhurst Beach, Maury I., King Co., Puget Sound	47°02'N 122°27'W	LW	14.8	Dipnet, shovel, hand picking	Fine gray sand, stones, <u>Zostera</u> Ulvaecae, detritus; LW-sub- tidal. Gravel, stones, coarse sand at HW
W9	16	Rocky Point, Eld Inlet, Mason Co.	47°04'N 123°01'W	LW	19.1 24.3	Dipnet, hand picking	Mud flats, oyster beds, moderately steep shell and mud banks. LW-HW
W10	16	Athens Beach, Budd Inlet, Mason Co.	47°07'N 122°55'W	LW	17.1	Dipnet	Muddy sand, stones, Ulvaecae LW-1/3 R
W11	17	Kennedy Creek mouth, head of Oyster Bay, Mason Co.	47°06'N 123°05'W	LW	15.8	Dipnet, hand picking	Muddy gravel, Ulvaecae, marsh grasses and roots. MW-HW
W12	17	Wildcat Harbor, mouth of Skookum Inlet, Mason Co.	47°09'N 123°01'W	MW	17.8	Hand picking	Steep mud and shell bank, <u>Grassostrea</u>
W13	17	Steamboat I. at Carylon Beach, Mason Co.	47°11'N 122°56'W	LW	inner side 17.8 29.3 outer side 15.9	Dipnet, hand picking	Gravelly sand, muddy sand, Ulvaecae. LW-MW
W14	18	Pt. Brown, mouth of Gray's Harbor, Gray's Harbor Co.	46°57'N 124°10'W	LW	16.1 31.2	Dipnet, shovel & screen	Fine gray sand; surf exposed flat beach. LW-sub-tidal
W15	19	South Bay, Gray's Harbor at Hwy bridge, Gray's Harbor Co.	46°52'N 124°03½'W	LW	17.8 25.0	Dipnet	Thick mud, sandy mud, <u>Zostera</u> at LW, stony abutments

TABLE I. (cont'd)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP °C	SAL'Y ‰	DEPTH & SAMPLING METHOD	HABITAT
W16	July 19	Washington Pt. Chenalis, inside breakwater, Westport, Gray's Harbor Co.	46°54'11"N 124°08'1"W	LW	16.6		Dipnet, shovel, hand picking	Fine sand, muddy sand; breakwater rocks, algae, LW - sub-tidal. Fine sand at HW
W17	20	Tokeland, Pacific Co., at Tokeloint Wharf	46°42'11"N 123°58'1"W	LW	17.6		Dipnet, hand picking	Steep muddy sand and sand shore; LW-HW levels
W18	20	Cape Shoalwater, north of point, Pacific Co.	46°04'1"N 124°06'1"W	LW	16.0	27.9	Dipnet, shovel & screen	Fine sand, surface-exposed & flat beach. LW-HW levels
W19	20	Ocean Shores, Gray's Harbor Co.	47°01'1"N 124°10'1"W	MW			Shovel & screen	Flat, fine, surf-exposed sand and silty sand beach. MW-2/5 R
W20	21	Pacific Beach, mouth of Joe Creek, Gray's Harbor Co.	47°12'11"N 124°12'1"W	LW	11.3	33.3	Dipnet, shovel, hand picking	Fine to medium sand and silty sand; surf-exposed flat beach
W21	22	Taholah, mouth of Quinault R., Gray's Harbor Co.	47°21'1"N 124°18'1"W	LW	16.0	low brack- ish.	Dipnet, hand picking, shovel	Dark silty sand, MW-LW. Coarse sand and pebbles at HW
W22	22	Pt. Grenville, south side, Gray's Harbor Co.	47°18'1"N 124°16'1"W	LW	9.8	33.4	Dipnet, hand picking	Fine silty, surf-exposed sand, bedrock and boulders. MW-LW. Small stream mouth at HW level

W23	22	Lake Quinault, near Falls Creek, Gray's Harbor Co.	47°27'N 123°47'W	22	FW	Dipnet	Sand, fine pebbles, grasses and grass roots at shoreline
W24	23	Kalaloch Beach, south of creek mouth, Jefferson Co.	47°36'N 124°22'W	10.0	33.4	Dipnet, shovel, hand picking	Fine clean dark sand, surf-exposed flat beach; embedded boulders and algae. LW-HW levels
W25	23	Ruby Beach, Jefferson Co.	47°43'N 124°25'W	MW		No collection	Steep gravel and coarse sand, MW
W26	24	La Push, mouth of Quill-ayute R., Clallam Co.	47°54'N 124°38'W	10.0	variable	Dipnet	Coarse sand, pebbles, surf shore; pebbles, algae, LW level in estuary
W27	24	Lake Crescent, Rosemary Lodge, SE shore, Clallam Co.	48°01'N 123°47'W	19.0	FW	Dipnet	Small, sharp, wave exposed stones at shoreline
W28	24	Lynch Cove, mouth of Little Mission Creek, Mason Co.	47°26'N 122°52'W	19.0	HR	Hand picking	Salt marsh, MHW-EHW levels; among grass roots and debris
W29	25	" " " " " "	" " " " " "	16.8	17.9	Dipnet, hand picking	Coarse sand, muddy sand, Zostera and filamentous algae, oyster flats. LW-MW
W30	25	Allyn, Case Inlet, Mason Co.	47°23'N 122°49'W	17.0	26.0	Dipnet, hand picking	Muddy shore, oyster shell banks, wharf pilings. LW-HW levels
W31	26	Marrowstone Isthmus, south side, Jefferson Co.	48°05'N 122°43'W	13.8	31.0	Dipnet	Sand, muddy sand, small stones, Zostera, outer and inner sides of spit. LW-HW
W32	26	Marrowstone Isthmus, south side, Jefferson Co.	48°01'N 122°42'W	LW		Dipnet, hand picking	Salt marsh at HW level. Sand and stone shore at LW level

TABLE I. (cont'd.)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP °C	SAL'Y ‰	DEPTH & SAMPLING METHOD	HABITAT
W32	July 26	Washington Dungeness Spit, at base, Clallam Co.	48°06'N 123°09'W	$\frac{1}{2}$ R			Hand picking	Coarse, surf-exposed sand and gravel erosion beach. HW level
W33	27	Crescent Beach, west end, Clallam Co.	48°09 $\frac{1}{2}$ 'N 123°43 $\frac{1}{2}$ 'W	LW	9.9	33.0	Dipnet, hand picking	Fine, moderately organic flat sand, and Zostera, surf-protected. LW-sub- tidal
W34	27	Crescent Beach, east end, Clallam Co.	48°10'N 123°42 $\frac{1}{2}$ 'W	LW	10.0		Dipnet, hand picking	Moderately surf-exposed flat clean sand beach; kelps and Phyllospadix. Conglomerate bedrock and boulders. LW-HW levels
W35	28	Agate Beach, west end, Clallam Co.	48°09 $\frac{1}{2}$ 'N 123°44'W	LW	10.0	32.7	Dipnet, hand picking	Conglomerate bedrock, boulders, gravel, sand patches; kelp and Phyllospadix. LW-HW levels
W36	29	Clallam Bay, at river mouth, Clallam Co.	48°15'N 124°16'W	LW	11.7	25.8	Dipnet, hand picking	Fine organic sand, embedded boulders, Phyllospadix and Chorda at LW. Coarse to medium sand and stones, MW-HW
W37	29	Seku River mouth, Clallam Co.	48°17'N 124°24'W	$\frac{1}{2}$ R			Hand picking	Gravelly sand, fine sand, MW-HW levels

W38	29	Mukkaw Bay, opposite Sooes estuary, Clallam Co.	48°18½'N 124°40'W	1R			Shovel, screen	Fine yellow sand, surf-exposed flat beach. HW-MW levels
	30	" "	" "	½R			Shovel, screen	Sand zonation samples, HW-MW
W39	30	Neah Fay at east boat slip, Clallam Co.	48°02'N 124°36'W	LW	11.8	32.7	Dipnet, hand picking	Medium coarse sand, muddy sand, Ulvaceae, Chorda at LW. Medium sand and stones, MW-HW
W40	31	Mukkaw Bay, at Sooes Pt., Clallam Co.	48°19'N 124°40'W	LW	12.3	32.6	Dipnet, hand picking	Fine sand, shelly sand, soft sandstone, bedrock and boulders, kelp, <u>Phyllospadix</u> , <u>Zostera</u> and <u>Chorda</u> . LW-MW levels
W41	31	Sooes estuary near mouth, Clallam Co.	48°10'N 124°39'W	½R			Shovel, screen	Steep, fine to medium sand banks. HW-LW levels
W42	Aug. 1	Shipwreck Pt., Clallam Co.	48°10'N 124°27½'W	LW	11.3	32.1	Dipnet, hand picking	Muddy sand over soft flat sandstone, stones; LW level. Dense algal beds; <u>Phyllospadix</u> and <u>Chorda</u>
W43	1	Lake Ozette, northwest end, at outflow, Clallam Co.	48°09'N 124°40'W		19.1	FW	Dipnet	Coarse sand, grass roots, aquatic plants, at shoreline
W44	2	Dungeness Lagoon at Middle Spit, Clallam Co.	48°07'N 123°07'W	LW	15.0	28.0	Dipnet, hand picking	Coarse sandy and muddy gravel with beds of <u>Zostera</u> , <u>Ulvaceae</u> at LW level. Coarse sand and stones at HW
W45	3	North Head, south end of Long Beach, Pacific Co.	46°19'N 124°04'W	LW	10.3	33.3	Dipnet, shovel, screen	Fine silty surf-pounded sand. Sandstone bedrock. LW-HW

TABLE I. (cont'd)

STATION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SAL'Y ‰	DEPTH & SAMPLING METHOD	HABITAT
W46	Aug. 4	Washington Leadbetter Pt., outer shore, north end Long Beach, Pacific Co.	46°38'N 124°04'W	LW	10.5	33.4	Dipnet, shovel, screen	Fine and medium sand; surf- exposed flat beach. LW-HW
W47	4	Nahcotta, at break- water; Willapa Bay, Pacific Co.	46°30'N 124°01'W	LW	17.9		Dipnet, hand picking	Sandy mud, oyster shells and Zostera; sandstones at LW; medium fine sand, MW-HW
W48	5	Chinook, west of town wharf, Pacific Co.	46°17'N 123°57'W	LW	17.1	11.5	Dipnet, hand picking	Muddy sandflats, pillings, LW. Salt marsh grasses, sand at HW
W49	5	Megler, north end of new highway bridge, Pacific Co.	46°14½'N 123°53'W	LW	17.0	brack- ish	Dipnet, hand picking	Moderately steep, exposed sandy shores; LW-HW
W50	6	Oregon; Cannon Beach, opposite Bird Locks, Clatsop Co.	45°54½'N 123°56'W	LW	10.5	33.8	Dipnet, shovel, screen	Surf-exposed, fine clean sand, bedrock, kelp, LW-HW levels
W51	6	Seaside, mouth of Necanicum R., Clatsop Co.	46°01'N 123°55'W	LW		brack- ish	Dipnet, hand picking	Outer beach, fine flat sand. Inner estuary, muddy sand, small stones. LW-HW
W52a	7	Clatsop Spit, at base of South Jetty, Clatsop Co.	46°13½'N 124°01½'W	LW	9.2	33.8	Dipnet	South beach, fine flat sand
W52b	"	"	"	LW	16.0	brack- ish	Dipnet, hand picking	Inside breakwater, fine sand, granitic blocks, fucoids; LW-HW

W53	8	Neahkannie Beach near Manzanita, Tillamook Co.	45°44'N 123°56'W	LW	8.9	33.8	Dipnet, shovel, hand picking	Fine yellow sand, surf-exposed flat beach; boulders, red algae; LW-HW
W54	10	Mary's River, 2 miles west of Philomath, Benton Co.	44°32'N 123°23'W		27.0	FW	Dipnet	Bedrock, sand, stones, woody detritus, riffles; slow flow
W55	11	Lost Creek, 7 miles south of Newport, Lincoln Co.	44°32'N 124°04'W	IR		brack- ish	Dipnet, shovel, screen, hand picking	Fine yellow sand, drift logs, MW-supratidal stream shores
W56	12	Heceta Beach, Lane Co.	44°02'N 124°08'W	IR	9.1		Shovel, screen	Fine yellow sand, flat surf-exposed beach. MW-HW levels
W57	12	Cape Ferpetua at Devil's Churn, Lane Co.	44°17'N 124°07'W	IR		brack- ish	Dipnet, hand picking	Lava bedrock, surf-exposed. HW - rock pools
W58	13	Seal Fock, Lincoln Co.	44°29'N 124°05'W	LW	9.0	34.0	Dipnet, hand picking	Sandstone bedrock, sand; kelps, Chorda, <u>Phyllospadix</u> and fucoids
W59	14	Agate Beach, north end, Lincoln Co.	44°40'N 124°03'W	MW	8.0		Dipnet	Medium coarse surf-exposed sand, embedded boulders
W60	14	Offer Rock at Marine Gardens, Lincoln Co.	44°45'N 124°04'W	LW	8.8	33.7	Dipnet, shovel, screen	Sandstone bedrock, algal covered, MW-LW. Sand, woody debris at HW
W61	15	Neskowin Beach, Tillamook Co.	45°05'N 123°59'W	LW	9.0	33.9	Dipnet, shovel & screen, hand picking	Surf-exposed, medium sand, shelly sand, volcanic bedrock; LW-HW

TABLE I. (cont'd)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SALY ‰	DEPTH & SAMPLING METHOD	HABITAT
W62	Aug. 15	Oregon D'River, outlet of Devil's Lake, Lincoln Co.	44°58'N 124°01'W	½R	24.0	FW	Dipnet, hand picking	Fine sand, stones, gravel filamentous algae, HW-supra tidal
W63	16	Cane Kiwanda, north side, Tillamook Co.	45°13½'N 123°58½'W	LW	8.5	34.0	Dipnet, shovel, hand picking	Surf-exposed flat fine sand; sandstone and shale bedrock; LW-HW levels
W64	17	Metart's Bay at Wilson Beach, Tillamook Co.	45°25½'N 123°56'W	LW	12.2	vari- able	Dipnet, shovel, & screen	Coarse sand, gravel, shells, <u>Zostera</u> , LW-sub-tidal
W64a		Near mouth of bay, north side, Tillamook Co.	45°26½'N 123°57'W	LW			Shovel & screen	Fine to medium sand, steep beach. LW level
W65	17	Tillamook Bay at base of Fitcher Pt., Tilla- mook Co.	45°30½'N 123°56½'W	LW	13.5	brack- ish	Dipnet, hand picking	Coarse organic sand, thick mud, embedded stones. MW- LW levels
W66	17	Cape Meares, north side, Tillamook Co.	45°30'N 123°58'W	½R	9.2		Dipnet, shovel & screen	Fine sand, surf-exposed, MW-HW. Sand-embedded stones at LW

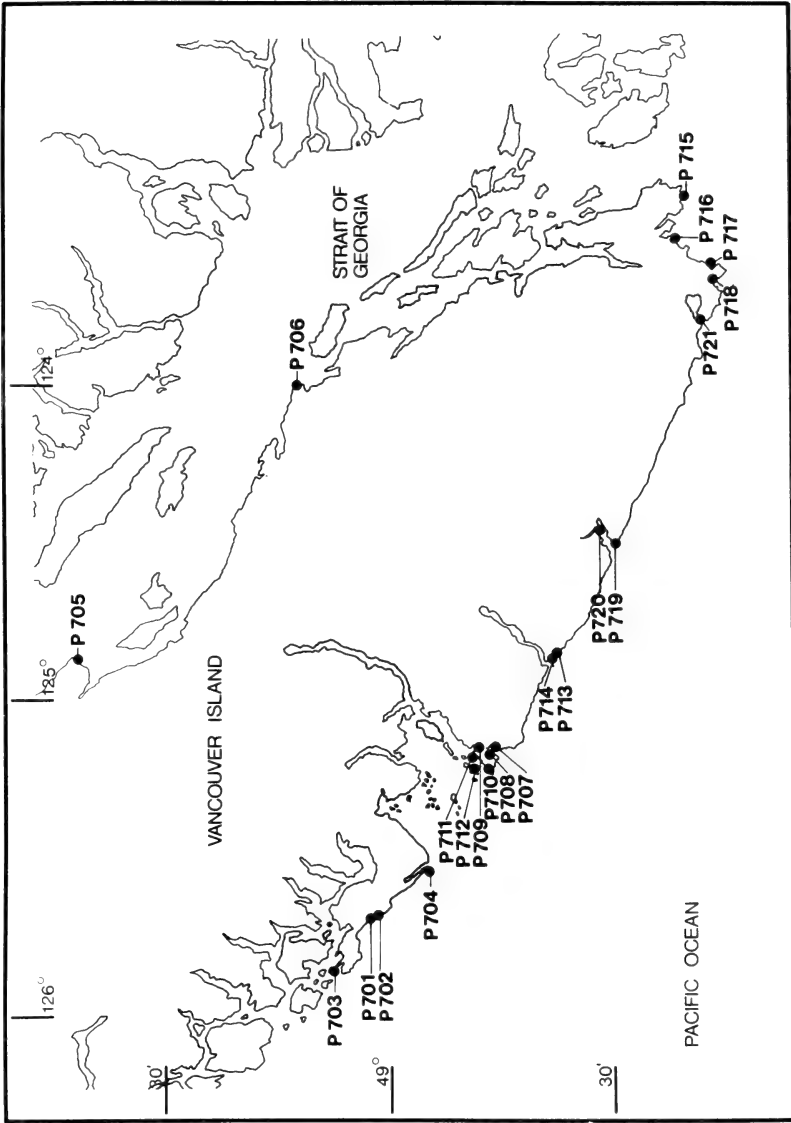


Fig. 8. Collecting localities in Vancouver Island, 1970

TABLE II. COLLECTING STATIONS, VANCOUVER ISLAND, 1970

(Collectors: E.L. Bousfield, Barbara, Marjorie, Mary and Kenneth Bousfield; L. Druehl)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SALTY ‰	DEPTH & SAMPLING METHOD	HABITAT
P701	July 5	Long Leach, south end	49°02'N 125°40'W	LW	11.0		Dipnet, shovel & screen	Hard, flat, surf-exposed sand. LW-HW levels
P702	6	Long Leach, south end	49°02'N 125°40'W	LW	11.0		Dipnet, hand picking	Bedrock, kelp, <u>Phyllospadix</u> , fucoids, LW-MW levels
P703	7	McKenzie Beach	49°07½'N 125°54'W	LW	13.5		Dipnet, shovel & screen	Protected ripple sand, kelp holdfasts, eel Grass
P704	8	Amphitrite Point	48°55'N 125°32'W	HW	12.5		Dipnet, hand picking	Bedrock, kelp; LW-HW plus supratidal pools
P705	13	Cape Lazo	49°43'N 124°52'W	LW	16.0		Dipnet, hand picking	Stones, reducing sand, <u>Ulva</u> , wave exposed
P706	14	Piper's Lagoon	49°14'N 123°58'W	LW	17.5		Dipnet, hand picking	Gravel, sand and mud flats, LW-HW levels
P707	16	Pachena Bay, south- east end	48°47.5'N 125°07'W	LW	16.1		Dipnet, hand picking	Surf-exposed gravelly sand, fine sand, boulders, bedrock <u>Phyllospadix</u> ; LW-MW

P708	17	Pachena Bay, north-west end	48°47.6'N 125°07.5'W	LW	16.0	Dipnet, shovel & LW level screen	Sand flats, ripple sand at LW level
P709	18	Bamfield Harbour at head	48°48.8'N 125°09'W	LW	14.0	Dipnet	Gravel and mud flats, eel grass beds, kelp, stones, shell at LW
P710	19	Cape Beale	48°47.2'N 125°13'W	LW	13.0	Dipnet, shovel & screen	Bedrock, boulders, kelp, <u>Phyllospadix</u> , partly wave exposed. Protected sandy cove
P711	20	Brady's Beach	48°49.8'N 125°09.5'W	LW	13.5	Dipnet, hand picking	Steep, fine sand beach; bedrock, boulders, algae
P712	21	Hanes I., Trevor Channel	48°47'N 125°25'W	LW	12.5	Dipnet, shovel & screen	Bedrock, boulders, kelp, eel grass and shelly sand. Semi-protected, LW-MW
P713	23	Clo-oose, main beach	48°40'N 124°49'W	LW	11.5	Dipnet, shovel & screen	Steep coarse to medium, wave-exposed sand. LW-HW levels
P714	24	Clo-oose, at settlement	48°41'N 124°49'W	LW	11.5	Dipnet, hand picking	Bedrock and boulders, kelp and <u>Phyllospadix</u> , coarse sand
P715	29	Gonzales Bay, Victoria	48°25'N 123°20'W	LW	11.2	Dipnet, hand picking	Bedrock, kelp (<u>Alaria</u> , <u>Egregia</u>), fine sand over pebbles. LW-HW levels
P716	30	Esquimault Lagoon	48°26'N 123°28'W	LW	11.8	Dipnet, shovel	Fine ripple sand at LW and sub-tidal. Small pebbles and algae. Sand at HW

TABLE II. (cont'd)

STATION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SAL'Y ‰	DEPTH & SAMPLING METHOD	LOCALITY
P717	July 31	Weir Beach, William Head	48°21'N 123°32'W	LW	10.6		Dipnet, shovel & screen	Fine slightly organic sand; wave protected. LW-HW levels
P718	31	Becher Bay, at head	48°21'N 123°35'W	LW	10.4		Dipnet, hand picking	Steep shores, bedrock, stones, gravel, algae. LW-MW levels
P719	Aug. 1	Botanical Beach, Cape San Juan	48°31'N 124°28'W	LW	11.0		Dipnet, hand picking	Vertically bedded slate bedrock, boulder, kelp, algae, Lithothamnion. LW-HW levels
P720	1	Port Fenfrew Beach	48°33'N 124°26'W	MW-HW	15.0		Shovel & screen, hand picking	Coarse sand over gravel. MW-HW levels
P721	2	East Cooke, inside point	48°22'N 123°43'W	LW	12.0		Dipnet, hand picking	Gravel, bedrock, kelp, Ulva, LW-HW levels

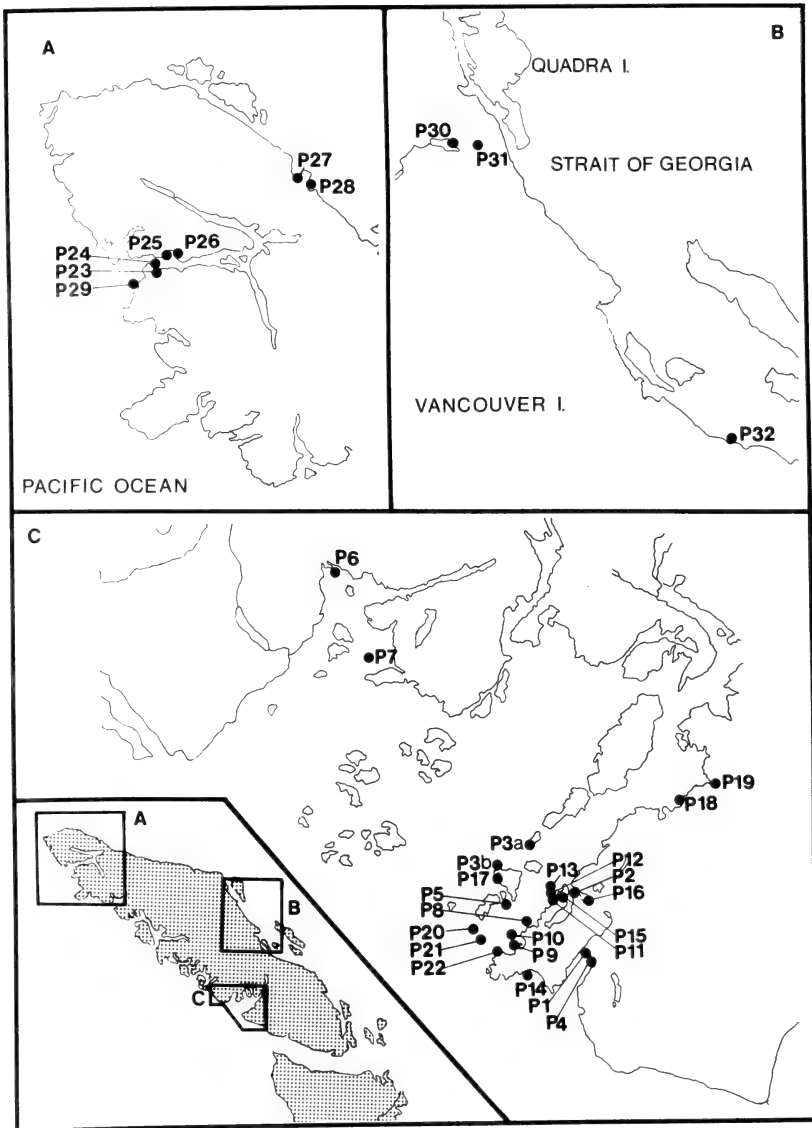


Fig. 9. Collecting localities in Vancouver Island, 1975

TABLE III.

COLLECTING STATIONS, VANCOUVER ISLAND, 1975

(Collectors: E.L. Bousfield; Barbara, Marjorie, Mary and Kenneth Bousfield; L. Druehl;
C. Levings; C. Haylock, M. Haylock, S. Tveit and crew R/V LEIK;
J. Ellerton)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SAL'Y ‰	DEPTH & SAMPLING METHOD	HABITAT
P1	July 22	Pachena Bay, beach at head	48°47'1" N 125°07'1" W	LW	c.14	32+	Dipnet, shovel & screen	a) Subtidal flat sand, surf b) LW-MWL flat sand c) MW-LW ripple sand d) HW drift
P2	23	Bamfield Marine Laboratory at small boat wharf	48°50' N 125°08' W	LW	c.13	c.30	Dipnet, hand picking	Float log fouling community at surface
P3a	23	Sandford I., SW side, Trevor Channel	48°52' N 125°10' W	LW	c.12	32+	Dipnet	Bedrock and boulders, brown algae, kelp, tide pools
P3b	23	Diana I.	48°51' N 125°12' W	LW	c.12		Dipnet, hand picking	Bedrock and algae, kelp
P4	24	Pachena Bay, centre islands	48°47'1" N 125°07' W	LW	c.14		Dipnet, shovel & screen	a) Sand flats LW-MW b) Sand at HW level
P5	25	Taylor I., Trevor Channel	48°49'1" N 125°12' W	LW	c.12	32+	Dipnet, hand picking	a) Bedrock, kelp, Phyllospadix clumps b) Subtidal kelp & rock walls c) Ascidians & sponges under large boulders d) Under stones & pebbles at LW-MW level e) HW spray pools
					15+	low brack- ish		

P6	26	Toquart Bay, NW side Barkley Sound	49°02'N 125°20½'W	LW	15+	brack- ish	Dipnet, shovel & screen, hand picking	a) Coarse sand, stones, eel grass b) Coarse sand, mud, eel grass c) Mouth of FW stream d) HW drift line, sand
P7	26	Wayne Bay, head of Loudoun Channel	48°59'N 125°19'W	MW	<10	32+	46 m trawl	Mud. Ratfish, <u>Loligo</u> , Ophiuroidea
P8	29	Trevor Channel, off Execution Rock, 400 m	48°49'N 125°11'W		<10	33+	20-24 m Agassiz dredge	Coarse sand, Cumacea, burrowing amphipods
P9	29	Trevor Channel, off Long Feach	48°48'N 125°11½'W		<10	33+	20-24 m bottom dredge	Shelly sand
P10	29	Trevor Channel, off Long Feach	48°48'N 125°11½'W		<10	32	30 m Ponar Grab	Coarse sand. Cumacea, burrowing amphipods
P11	29	Off Brady's Beach 200 m	48°50'N 125°09½'W				6-24 m dredge	Medium sand and algae. Ophiuroids, burrowing amphipods (<u>Photis</u>)
P12	29	Off Brady's Beach, 300-400 m	48°50'N 125°09½'W		<10	>32	30 m dredge	Sand and algae. Bivalves
P13	29	Trevor Channel, off Brady's Beach	48°50½'N 125°09½'W		<10	>32	34 m 2 Ponar grabs	Muddy sand

TABLE III. (cont'd)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SAL'Y ‰	DEPTH & SAMPLING METHOD	HABITAT
P14	Aug. 2	Keeha Bay, NW end at head	48°47'N 125°11'W	LW	<10	>33	4-12 m Natural- ist's dredge 3 hauls HW and supra- tidal	Fine and medium sand Steep sand
P15	3	Bamfield, Vancouver I., at Bristol Foster's cabin	48°50'N 125°08½'W		10	FW	Dipnet	Cold clear spring, moss and woody detritus
P16	5	Grappler Inlet (near Bamfield)	48°50'N 125°07'W	LW- HW	c.13	32	Dipnet, hand picking, 4-8 m dredge	a) Intertidal shelly mud Zostera, stones, bedrock b) Subtidal, stones, echinoderms, kelp
P17	6	Diana I., Kirby Point Bay	48°51'N 125°12'W	LW	c.12	>32	Dipnet Hand picking	a) Shelly sand, Zostera and Phyllospadix flats b) Coarse sand and gravel at drift line c) Small cold brook mouth d) Rocky shore, sponges ascidians and kelp e) Sand and stones
P18	8	Christie Bay, NW end, near Sarita	48°53'N 125°02'W	LW	c.15	25	4-8 m Natural- ist's dredge	a) Bedrock, gravel, stones, Zostera, algae; flats b) Log (bark) MW

P19	8	Sarita R., estuary, 1.4 km, above mouth	48°54'N 125°0½'W	LW	c.15	<10	Dipnet, hand picking	a) Gravel, stones, Enteromorpha, kelp (logs) b) Under drift debris in salt grass at upper barnacle level
P20	9	Bordelais Islets, entrance to Trevor Channel	48°49'N 125°13½'W	LW	c.12	33+	Dipnet, hand picking	a) In <u>Phyllosadix</u> roots and under stones b) In kelp holdfast, on rock c) In sponges, tunicates, on rocky walls of surge channels
P21	9	Trevor Channel, off Bordelais Islets	48°48½'N 125°13½'W	HW	<10	33+	44 m, Ekman Grab heavy 44-50 m, light dredge (line)	a) Fine sand b) Fine sand, shell
P22	9	Trevor Channel, off Cape Beale 300 m	48°48'N 125°12½'W	HW	10	33+	30 m dredge	Sand, shell, stones, Olivella, Crangon Cumacea
P23	14	Quatsino Sound, mouth of Mahotta Creek, Koskimo Bay	50°27½'N 127°51½'W	LW	c.12	33+	Hand picking 2-4 m, Natural- ist's dredge 4 m, dredge	a) Sand and stony beach at HW level b) Sand, <u>Zostera</u> , <u>Ulva</u> c) Eel grass, muddy debris
P24	14	Koskimo Bay, at anchorage	50°28'N 127°51½'W	LW	c.10	33	24-30 m	Mud, silt, debris. Amphipod community

TABLE III. (cont'd)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. OC	SAL'Y o/oo	DEPTH & SAMPLING METHOD	HABITAT
P25	Aug. 14	Robson Cove, Dockyard I., to Schloss I., channel	50°30'N 127°52'W		<10	33+	16 m, dredge	Stones, algae, debris. Decapod shrimp, <u>Turbo</u>
P26	14	Koprino Harbour, Schloss I., to Ives Pt., off Sand Flats	50°30'N 127°51½'W	MW	>10	>33	12-16 m dredge	Mud, shell, debris
P27	15	Small streams, 3 km east Port Hardy marine highway	50°41'N 127°27½'W		c.15	FW	Dipnet	Tea brown, acid stream; lentic
P28	15	Beaver Harbour	50°42'N 127°25'W	MW- HW	13	32	Dipnet, shovel & screen	Fine sand, beach at west end
P29	16	Gooding Cove, entrance to Quatsino Sound	50°24'N 127°57'W	LW- MW	11	>33	12-14 m, dredge 8 m, dredge Hand picking	a) Gravel, coarse sand, algae b) Sand, needles, woody debris c) Fine sand, detritus d) Medium fine sand, MW-HW
P30	17	Campbell Lake, north end at old RR bridge	49°52'N 125°28'W	15- 16	FW		Dipnet	Stones, gravel, grasses near shore (fluctuating water level)
P31	17	Gosling Lake (?) at camp 25 km above Campbell R., on highway	49°54'N 125°25'W	14	FW (acid)		Dipnet	Woody debris, Nuphar, stones

P32 18 Little Qualicum Beach 49°24'N 124°37'W LW 17 27 Dipnet, hand picking a) Fine ripple sand, gravel and sand b) HW drift debris

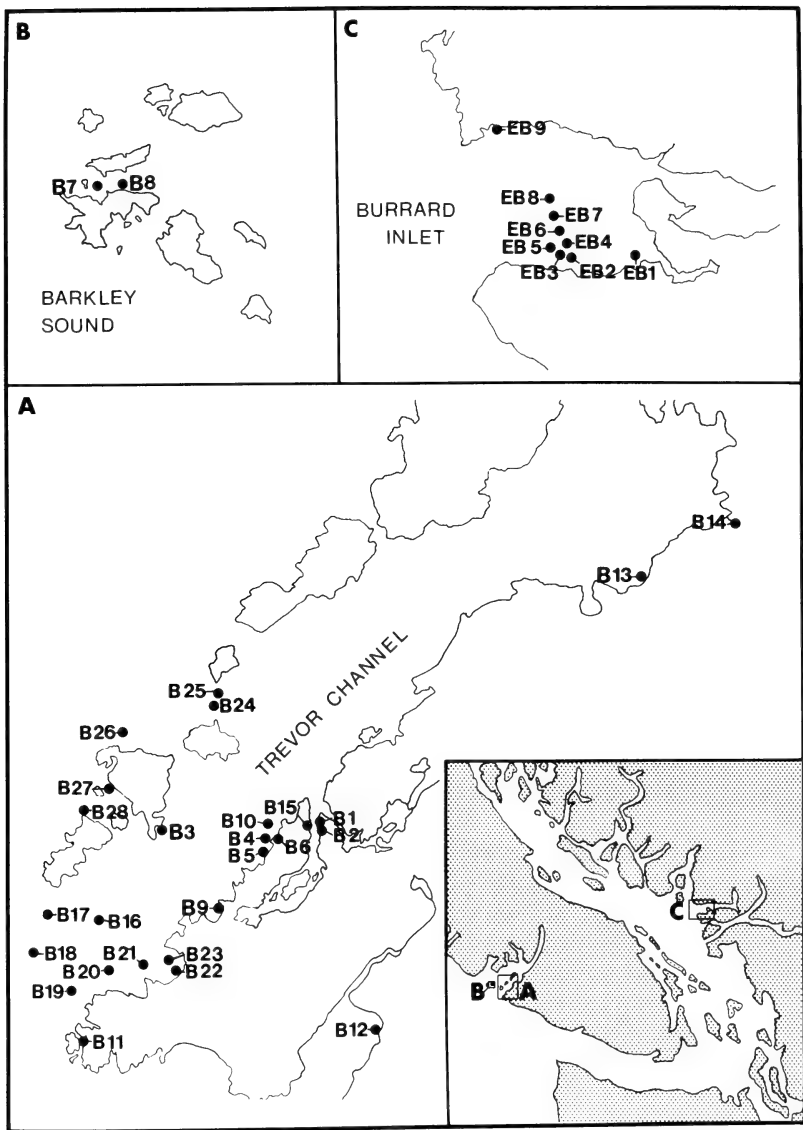


Fig. 10. Collecting localities in Vancouver Island and Burrard Inlet, 1976

TABLE IV. COLLECTING STATIONS, VANCOUVER ISLAND AND BURRARD INLET, 1976
 (Collectors: E.L. Bousfield, Sandy Matheson and crew R/V ACTIVE LASS, F. Rafi, M. Haylock,
 A. Spencer, I. Lawn, S. Tveit and crew R/V LEIK, BMS students)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SAL·Y ‰	DEPTH & SAMPLING METHOD	HABITAT
	June							
EB1	16	English Bay, off Kitsilano Point, Burrard Inlet	49°16'N 123°10'W				Van Veen grab, 6 m	Heavy mud; worms, molluscs
EB2	16	English Bay, off Jericho Beach, Burrard Inlet	49°16'N 123°11'W				Van Veen grab, 2 m	Sandy mud; molluscs
EB3	16	English Bay, off Jericho Beach, Burrard Inlet	49°16'N 123°11.5'W				Ponar grab, 4 m	Sand. Worms, Cumacea <u>Exosphaeroma</u>
EB4	16	English Bay off Jericho Beach, Burrard Inlet	49°17'N 123°11'W				Ponar grab, 4 m	Sandy mud. Cumacea, Amphipoda
EB5	16	English Bay, off Jericho Beach, Burrard Inlet	49°16.5'N 123°12'W				Natural- ist's dredge, 10 m	Mud. Copepoda, Cumacea, Amphipoda
EB6	16	Off Spanish Bank marker, Burrard Inlet	49°18'N 123°11.5'W				2-10 m	Sand and wood chips. Cumacea Amphipoda
EB7	16	Off Spanish Bank marker, Burrard Inlet	49°18.5'N 123°11.5'W				26 m	Muddy sand. Mollusca, Poly- chaeta, Copepoda, Amphipoda

EB8	16	Off Spanish Bank marker, Burrard Inlet	49°01'N 123°12'W		40 m	Mud, Mollusca, a few crustaceans
EB9	16	Stearman Beach, Burrard Inlet	49°21'N 123°15'W	MW-HW	Dipnet, hand picking	Stones, bedrock. Amphipoda
B1	24	Bamfield Marine Station at main float	48°50'N 125°08'W	Sur-face	c.13	Blocks suspended from dock. Hydroid fouling communities
B2	24	Bamfield Marine Station, main float, logs north end	48°50'N 125°08'W		c.13	Fouling organisms at ends of logs. Mussels, algae, hydroids
B3	25	Diana I., Trevor Chanrel beach, south side	48°50.2'N 125°11'W	LW-HW	c.12	32+ Dipnet, hand picking a) Kelps, encrusting algae on boulders and bedrock; LW, Phyllospadix roots b) Under stones; MW c) Sand and under logs; HW
B4	25	Off Frady's Beach	48°50.3'N		c.10	32+ 60-70 m Naturalist's dredge Sand and algae. Amphipod communities
B5	26	Brady's Beach, south end	48°49.8'N 125°09'W	LW-HW	c.13	32+ Dipnet, hand picking a) Boulders embedded in sand, Phyllospadix, kelp, brown algae; LW b) Sand at MW-HW level c) HW pools
B6	26	Brady's Beach, north end	48°50'N 125°09'W	HW	c.13	30+ Shovel & screen Sand of various texture a) Fine sand middle and south beach b) Coarse sand above shell

TABLE IV. (Cont'd)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SAL'Y o/oo	DEPTH & SAMPLING METHOD	HABITAT
B7	June 27	Broken I., west side of Wouwer I.	48°51.6'N 125°21'W	LW	c.12	32+	Dipnet, hand picking	Bedrock, <u>Phyllospadix</u> , kelp Under rock sponges, holdfast boulders. Amphipod communities
B8	27	East Bay, Wouwer I.	48°51.7'N 125°21'W	LW & HW	c.14	32+	Dipnet, hand picking	Fine gravel, clam beds, <u>Ulva</u> , sand at HW
B9	28	Trevor Channel off Second Beach	48°49'N 125°10.4'W		c.10	32+	16 m dredge; fine mesh dredge; 20-24 m grab; 24 m grab; 14-16 m Ponar grab;	a) Rock and sand b) Not successful; few shrimps c) Medium sand d) Fine sand e) Coarse sand, inshore
B10	28	Trevor Channel, off Brady's Beach	48°50.1'N 125°09'W		c.8	32+	30-34 m Ponar grab; 20 m grab; 10 m Ponar grab; 10-20 m large dredge;	a) Shelly sand b) Fine sand c) Sand d) Sand

B11	29	Cape Beale, sand flat behind island at west end	48°47.3'N 125°12'W	LW- LR	c.12		Dipnet	a) At extreme LW sandflat, shelly mud, barnacles and worms, shell, eel grass b) At main LW and above at upper border of <u>Zostera</u> , sandy mud
July								
B12	1	Fachena Bay	48°47½'N 125°07'W	LW	c.13	26- 28	Dipnet	Open light surf sand, rocks, boulders, <u>Phyllospadix</u> , <u>Eudistylus</u> tubes, dead and alive
B13	2	Christie Bay	48°53.0'N 125°02'W	LW- LR	c.14	26	Dipnet	Bedrock, muddy sand eel Grass, algae. Fine Gravel, subtidal
B14	2	Sarita River estuary near mouth	48°53.2'N 125°0.5'W	LW MW- HW	c.14	<10 0-10	Dipnet, hand picking	a) River bed stones, old logs at LW fucooids b) Under stones, stream c) <u>Carex</u> roots
B15	4	Bristol Foster's spring, Bamfield	48°50'N 125°08½'W	5	5	FW	Dipnet	Small cold spring, wood chips, moss
B16	5	Trevor Channel at mouth, off Bordelais and Edward King I.	48°48.7'N 125°12.5'W	c.8	c.8	33+	44-50 m dredge (heavy)	Sand and gravel. Amphipods and mysids
B17	5	Off Bordelais Islet, Trevor Channel	48°47.8'N 125°13.6'W	c.8	c.8	33+	44 m dredge	Sandy, Gravel. Amphipods
B18	5	Off Bordelais Islet	48°48.5'N 125°14.0'W	c.8	c.8	33+	46 m dredge	Gravelly sand (rich haul of amphipods)
B19	5	800 m, off Cape Beale	48°48.2'N 125°13.0'W	c.8	c.8	33+	40 m dredge	Gravel, rounded (very poor fauna)

TABLE IV. (cont'd)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SALY ‰	DEPTH & SAMPLING METHOD	HABITAT
B20	July 5	Off Long Beach	48°48.0'N 125°12.0'W		c.8	33+	30 m dredge	Gravel, stones (small). Amphipods and mysids
B21	5	Off Long Beach	48°48.2'N 125°11.3'W		c.8	33+	20-22 m Natural- ist's dredge	Gravel, rich in pontogeneiid amphipods
B22	5	Off Long Beach	48°48.2'N 125°11.0'W		c.10	32+	12-20 m Natural- ist's dredge	Fouled by diatom strings. Amphipod community
B23	5	Off Long Beach	48°48.5'N 125°11.0'W		c.10	32+	8 m Natural- ist's dredge	Fouled by detritus (very poor fauna)
B24	8	Helby and Diana I., Satellite Passage off Helby I.	48°51.5'N 125°10.4'W		c.10	32+	40 m dredge	Worm tubes, shells. <u>Ampelisca</u> community
B25	8	Satellite Passage, SE of Sandford I.	48°51.5'N 125°10.5'W		c.10	32+	30-40 m	Shell, algae, eelgrass, coral. Turricates, <u>Erichthonius</u>
B26	8	North of Diana I.	48°51.2'N 125°11.6'W		c.10	32+	24-35 m dredge	Shelly mud and stones. Mollusc community
B27	8	Dodger Channel, SW end Diana I.	48°50.4'N 125°12.1'W		c.10	32+	8-10 m Natural- ist's dredge	Sand. Amphipod community

B28 10 Edward King I. 4850.2'N LW- 32+ Dipnet, a) Bedrock, boulders, algae
125°12.5'W HW c.12 sponge phyllospadix roots. LW
hand b) MW under rocks
picking c) HW pools. Hyal
community

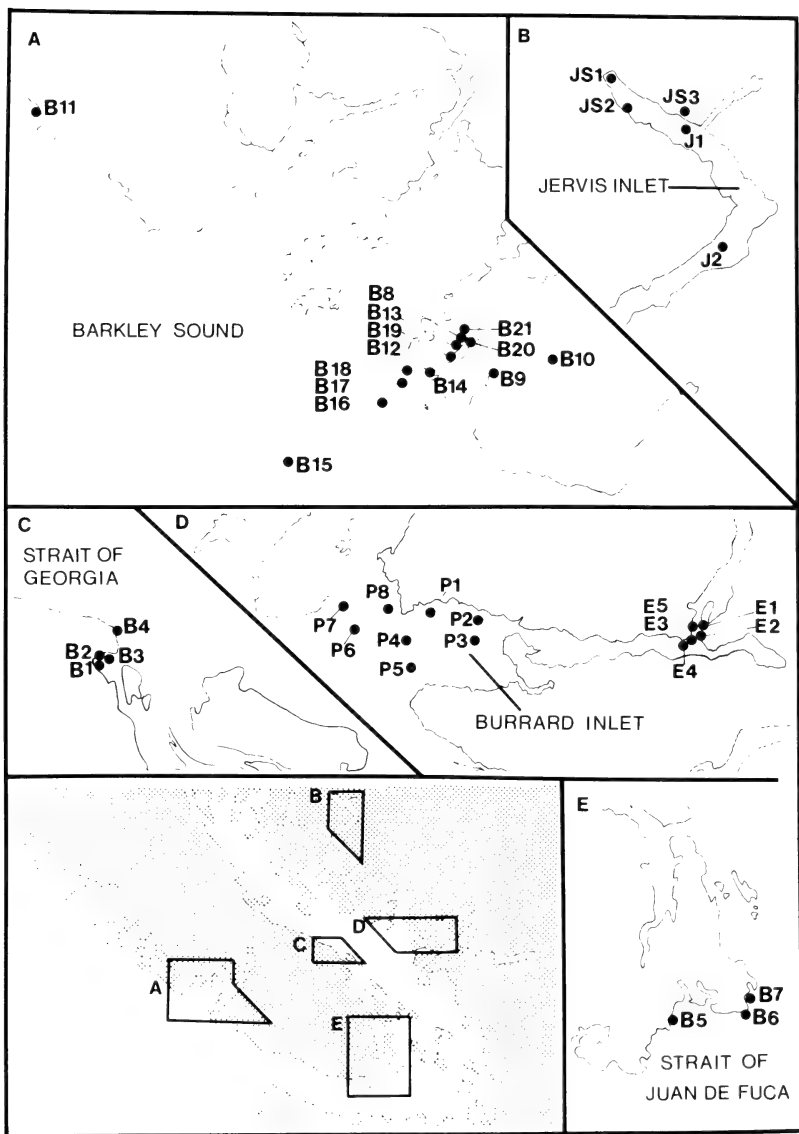


Fig. 11. Collecting localities in Vancouver Island, Jervis Inlet, and Burrard Inlet, 1977

TABLE V. COLLECTING STATIONS, VANCOUVER ISLAND, JERVIS INLET AND BURRARD INLET, 1977
 (Collectors: E.L. Bousfield, F. Rafi, J.F.L. Hart, R. Long, S. Tveit and crew R/V LEIK,
 S. Matheson and crew R/V ACTIVE LASS, C. Levings, G. Christie, Capt. Marsden
 and crew R/V VECTOR)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. OC	SAL'Y o/oo	DEPTH & SAMPLING METHOD	HABITAT
B1	May 14	Departure Bay, north of Nanaimo off Hammond Beach	49°12'N 123°56'W	LW			17-5 m Natural- ist's dredge	Sandy mud and algal roots
B2	14	"	"		10		1-3 m	Sand, eelgrass
B3	14	"	"				33-17 m Natural- ist's dredge	Ooze and debris
B4a	15	Piper's Lagoon	49°14'N 123°58'W	LW & sub- tidal			Dipnet	Stones and boulders, algae LW-MW
B4b	15	"	"				Shovel & screen	Sandy mud, LW-MW
B4c	15	"	"	HW			Hand picking	Drift debris, HW
B5a	17	Witty's Lagoon, west of Victoria	48°22'N 123°29'W	Sub- tidal	c.9	c.33	Dipnet	Dark organic ripple sand
B5b	17	"	"	LW			Shovel & screen	Sand surface

B5c	17	Witty's Lagoon, west of Victoria	48°22'N 123°29'W	LW	Shovel & screen	Sand pool, worm burrows
B5d	17	"	"	LW	Dipnet	In floating Ulvaceae
B5e	17	"	"	MW	Dipnet	Ripple sand, mostly around boulders
B5f	17	"	"	HW	Shovel, hand picking	Debris, in sand
B6a	18	Trial I. Point, Victoria	48°24'N 123°19'W	LW sub-tidal	>33 Dipnet	Phyllospadix, bedrock, <u>Erebia</u> and algae
B6b	18	"	"	HW	brack- ish Dipnet	Rock pools, very brackish
B6c	18	Trial I. Point, east of point	"	LW sub-tidal	Dipnet	Coarse to fine gravel
B7a	19	Willis Beach at Oak Bay, Victoria	48°25'N 123°18'W	LW sub-tidal	Dipnet	Mud rock and algae
B7b	19	"	"	MW-LW	Dipnet, shovel & screen	Sandy mud and polychaete burrows
B8	21	Off Brady's Beach, Bamfield	48°49.6'N 125°09.2'W		5-10 m Natural-ist's dredge	Stones, sand and algae

TABLE V. (cont'd)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SAL'Y o/oo	DEPTH & SAMPLING METHOD	HABITAT
B9	May 22	Roadside ditch at Pachena Creek bridge, near Bamfield	48°48.2'N 125°07'W		c.10	FW	Dipnet	Mosses, grass, bottom debris
B10	22	Small steep stream 8 km, NE of Pachena Bay	48°48'N 125°00'W		c.8	FW	No coll- ection	<u>Pacifastacus</u> crayfish seen
B11a	23	Wickeninnish Bay, south end Long Beach at lodge	49°03'N 125°42'W	LW	11		Dipnet	Sand (Ampelisca tubes) at rock pool. LW-MW
B11b	23	"	"	LR			Dipnet, hand picking	Phyllospadix roots, steep rock walls with sponge hydroid and algae. LW-MW
B11c	23	"	"	HW			Shovel, hand picking	In sand and under drift debris
B12a	24	First Beach, below Brady's Beach	48°49.2'N 125°09.8'W	LR			Dipnet	Bedrock pools at and above MW level, scour pools
B12b	24	"	"	LR		brack- ish	Dipnet	Brackish pools with <u>Enteromorpha</u>
B12c	24	"	"	LR		brack- ish	Dipnet	Spray pools (above sculpin level)

B12d	24	First Beach, below Brady's Beach	48°49.2'N 125°09.8'W	LR			Dipnet	In mussel beds on rock under <u>Fucus</u> . MW-LW
B12e	24	"	"	LW			Dipnet	Algae and kelp; subtidal
B13	25	Trevor Channel off Brady's Beach	48°49.6'N 125°10.5'W				6-14 m dredge	Hard sand, stone, algae
B14	25	Trevor Channel off Execution Rock	48°48'N 125°11.2'W				44-54 m dredge	Sandy mud algae, debris
B15	30	Three-mile Bank, off Cape Beale	48°46'N 125°25'W				110-120 m dredge	Mud and clay
B16	30	Off Cape Beale, 1.60 km southwest	48°47'N 125°14'W				60-54 m dredge	Fine gravel, stones, ophiuroids
B17	30	Off Cape Beale, mouth Trevor Channel	48°47.5'N 125°14'W				44-40 m	Sand and tube worms
B18	30	Mouth of Trevor Channel	48°48.0'N 125°13.5'W				36-40 m Natural- ist's dredge	Sand and fine shell
B19a	June 1	Brady's Beach, west end	48°49.7'N 125°09.2'W	LW			Dipnet	Bedrock, <u>Phyllospadix</u> at infralittoral fringe, LW-HW levels
B19b	1	Brady's Beach, east end	48°49.7'N 125°09.2'W	LW			Dipnet, shovel & screen	Fine shelly sand, ripple sand beyond wave wash. MW-LW levels

TABLE V. (cont'd)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SAL'Y ‰	DEPTH & SAMPLING METHOD	HABITAT
B20	June 1	Pools along footpath to Brady's Beach	48°49.7'N 125°09.2'W		7	FW	Dipnet	Leafy detritus
B21a	1	Off Brady's Beach	48°49.6'N 125°09.2'W				16-30 m Natural- ist's dredge	Sand and algae
B21b	1	"	"				10-20 m Natural- ist's dredge	Sand, algae, sticks and debris
J1	May 12	Head of Jervis Inlet, Queen's Beach	50°12'N 123°54'W				360 m bottom sled	Ooze and detritus
J2	12	Princess Royal Beach, off Pt. Frederick Williams, Jervis Inlet	50°01'N 123°52'W				576 m sled mid- channel	Mud, woody debris
J51	12	Head of Jervis Inlet	50°15'N 123°58'W	LW			Dipnet, hand picking	Gravel and mud. LW-MW
J52	12	Mouth of Lausmann Creek, Jervis Inlet	50°12'N 123°56'W	LR			Dipnet, hand picking	Gravel, stones, eelgrass MW

JS3	12	Jervis Inlet, north of Princess Louisa Inlet	50°12'N 123°52'W	1/2 R	Dipnet, hand picking	Gravel and stones. MW
P1	Nov. 2	Pilot Cove, 300 m south	49°20'N 123°15'W		44-50 m Natural- ist's dredge (2 hauls)	Mud and woody detritus
P2	2	West Fay, 400 m south	49°19'N 123°12'W		20-24 m Natural- ist's dredge	Mud and wood chips
P3	2	West Eay, 1 km south	49°18'N 123°12'W		60 m Natural- ist's dredge	Woody detritus, mud
P4	2	Mouth of Burrard Inlet	49°18.9'N 123°16.0'W		110 m Natural- ist's dredge SCOR (vert. plankton haul)	Fine mud
P5	2	Mouth of Burrard Inlet off Pt. Grey	49°18.0'N 123°16.0'W		80 m Natural- ist's dredge	Fine silt clays; decapods, amphipods, cumaceans
P6	3	Strait of Georgia off Burrard Inlet	49°19.3'N 123°17.7'W		160 m Natural- ist's dredge	Mud. Ophiuroidea

TABLE V. (cont'd)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. OC	SAL'Y o/oo	DEPTH & SAMPLING METHOD	HABITAT
P7	Nov. 3	Queen Charlotte Channel SE of Bowen I.	49°10.5'N 123°20.5'W				240 m Natural- ist's dredge SCOR (plank- ton haul)	Mud, woody debris
P8	3	Queen Charlotte Channel E of Passage I.	49°20.5'N 123°17.5'W				130 m Natural- ist's dredge	Mud, woody detritus; rich amphipod and decapod fauna
E1	4	Belcarra Bay at mouth of Indian Arm	49°18.9'N 122°55.8'W				20-24 m Natural- ist's dredge	Mud and woody detritus. Epifaunal series below euphotic zone
E2	4	Off Belcarra Wharf (Indian Arm)	49°18.8'N 122°55.7'W				10-12 m Natural- ist's dredge	Stones, algae, woody detritus. Amphipods, isopods, decapods
E3	4	Off Dollarton boat sheds (Indian Arm)	49°18.6'N 122°56.7'W				16-20 m Natural- ist's dredge	Stones, coarse sand, woody debris
E4	4	Roche Pt., (Indian Arm)	49°18.0'N 122°57.4'W				8 m Natural- ist's dredge	Algae holdfasts, coarse sand. <u>Zostera</u> , Amphithoe

60 m Mud and coarse sand
Natural-
ist's
dredge
SCOR
(plank-
ton
haul)

49°18.8'N
122°56.3'W

4 Indian Arm, south
channel

E5

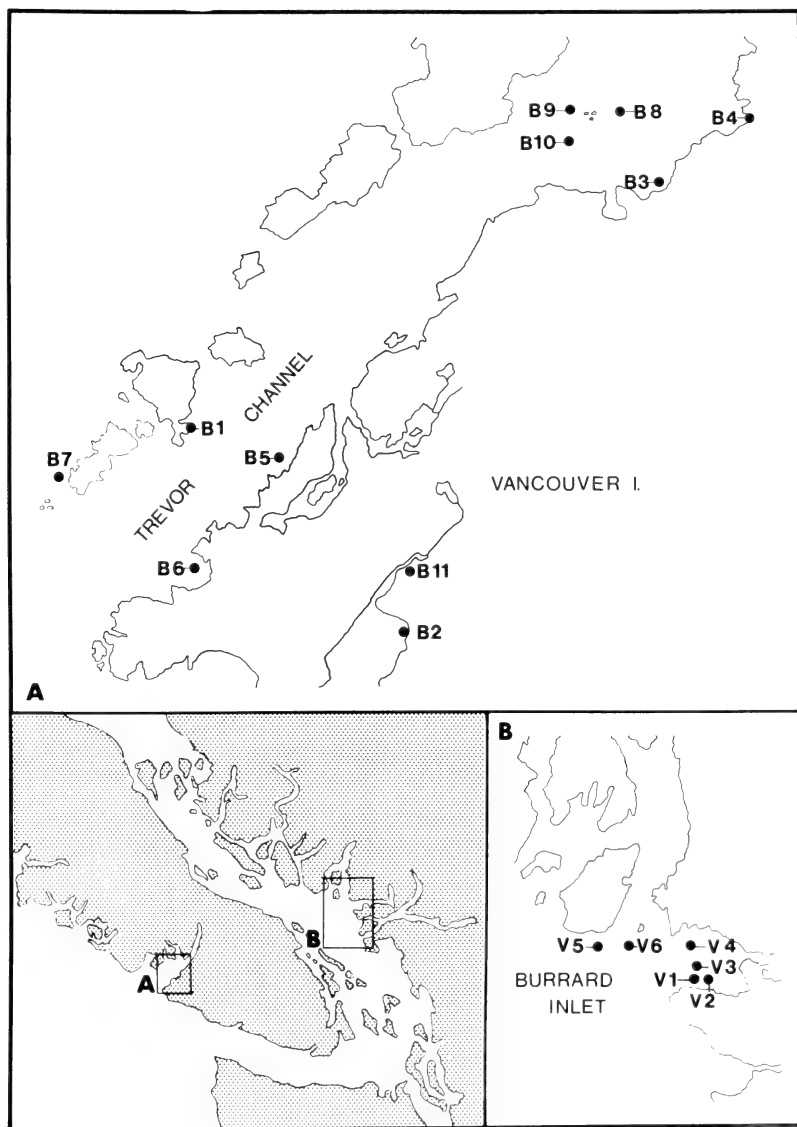


Fig. 12. Collecting localities in Vancouver Island and Burrard Inlet, 1978

TABLE VI. COLLECTING STATIONS, VANCOUVER ISLAND AND BURRARD INLET, 1978
 (Collectors: E.L. Bousfield, BMS student class, Sig. Tveit and crew R/V LEIK,
 Sandy Matheson and crew R/V ACTIVE LASS)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. OC	SAL'Y o/oo	DEPTH & SAMPLING METHOD	HABITAT
B1	June 24	Diana I., Trevor Channel, Vancouver I.	48°50.2'N 125°10.1'W	LW			Dipnet	Rocky shore, macroalgae HW spray pools; eel grass; freshwater stream at HW
B2	25	Pachena Bay, Vancouver I.	48°47.5'N 125°07.5'W	LW			Dipnet, hand picking	Sandy beach; LW-HW Boulders and <u>Phyllospadix</u>
B3	26	Christie Bay, Trevor Channel, Vancouver I.	48°53'N 125°02'W	LW			Dipnet, hand picking	Rock, eelgrass, sand Pebbles; LW-HW
B4	26	Sarita Estuary, Trevor Channel, Vancouver I.	48°53.2'N 125°05'W	LW			Dipnet	Stones; <u>Enteromorpha</u>
B5	27	Off Brady's Beach, Trevor Channel, Vancouver I.	48°49.6'N 125°09.2'W				14-24 m bottom dredge 10 m	Sand, sticks Macroalgae, sand
B6	27	Off Long Beach, Trevor Channel, Vancouver I.	48°48.2'N 125°10.9'W				20-24 m bottom dredge	Sand and fine gravel
B7	27	Edward King I., Hammond Passage, Vancouver I.	48°49.5'N 125°13.5'W				50-56 m bottom dredge	Shell

B8	28	Mumlamis Bay in Trevor Channel, Vancouver I.	48°04.2'N 125°02.5'W	160-240 m Mud, clay dredge
B9	28	West side San José Islets, Trevor Channel, Vancouver I.	48°04.0'N 125°03.5'W	32 m Sandy mud, rock dredge
B10	28	Trevor Channel, south of San José Islets, Vancouver I.	48°05.7'N 125°03.5'W	166 m Euphausiacea; <u>Cyphocaris</u> plank- ton tow
B11	26	Ditot beside Pachena Bay Road, Vancouver I.	48°04.2'N 125°07'W	Dipnet; Weeds and filamentous algae shallow
V1	July 4	Burrard Inlet, Spanish Banks, just west of shore marker	49°16.5'N 123°13.0'W	3-8 m Mud, sand, wood chips Natural- ist's dredge
V2	4	Burrard Inlet, Spanish Banks, just east of shore marker	49°16.5'N 123°14.0'W	3-8 m Hard sand, woody detritus; Natural- ist's dredge
V3	4	Burrard Inlet, Spanish Banks, 300 m north of shore marker	49°18.0'N 123°13.5'W	25 m Sand, shell Natural- ist's dredge
V4	4	Burrard Inlet, mid-point between Spanish Banks and West Vancouver	49°19.0'N 123°13.5'W	50 m Sandy mud, shell, worm tubes Natural- ist's dredge

TABLE VI. (cont'd)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SAL'Y ‰	DEPTH & SAMPLING METHOD	HABITAT
V5	July 5	Burrard Inlet, off entrance 1 km off Cowan Pt., Bowen I.	49°20'N 123°20'W				280 m Natural- ist's dredge (2 hauls)	Fine mud, woody detritus
V6	5	Burrard Inlet, 1.6 km south of Passage I.	49°19.0'N 123°19.0'W				160 m Natural- ist's dredge (2 hauls)	Fine mud, woody detritus

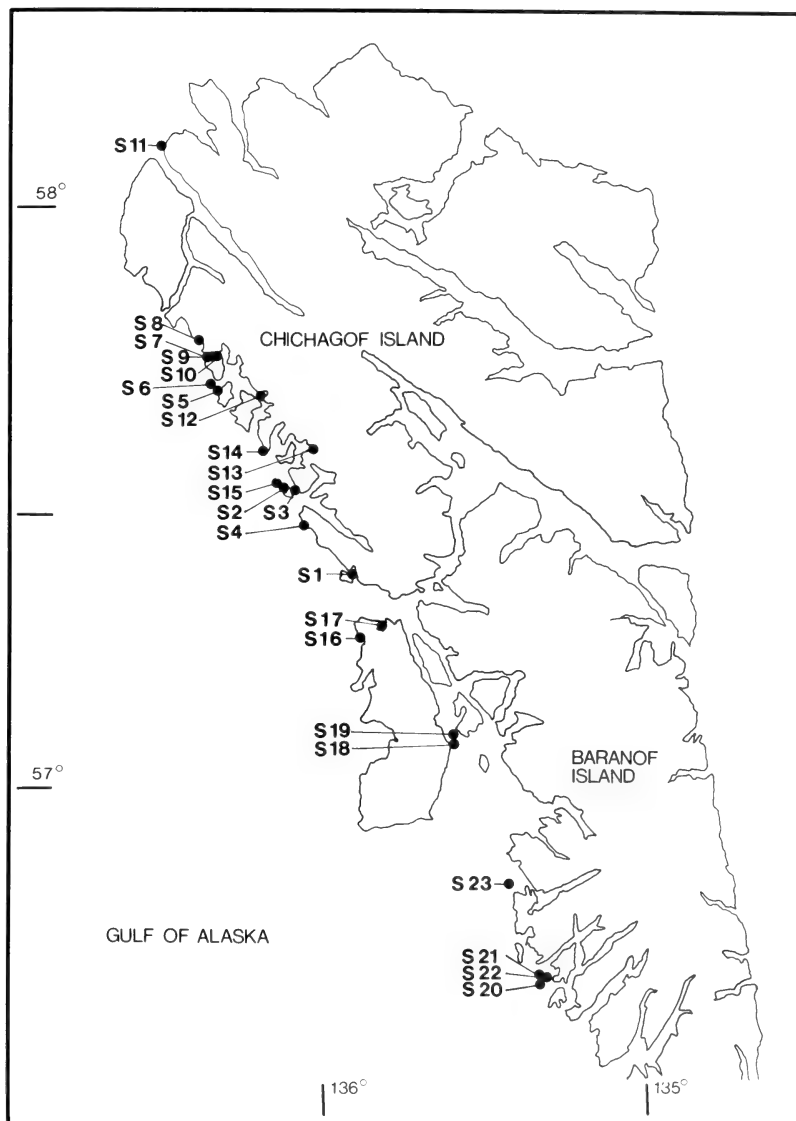


Fig.13. Collecting localities in Sitka Region, southeastern Alaska, 1980

TABLE VII. COLLECTING STATIONS, SITKA REGION, SOUTHEASTERN ALASKA, 1980
 (Collectors: E.L. Bousfield, J.J. Dickinson, P. Frank, K. Conlan, R. Billings
 and crew R/V SULTANA)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SAL'Y ‰	DEPTH & SAMPLING METHOD	HABITAT
July								
S1								
F1	26	Leo Anchorage, Klokachef I.	57°25'N 135°51'W	HW			6-10m dredge	Stones, kelp
F2				HW			Ekman grab	Coarse shelly sand, silt
L1		Inside Klokachef I.					13 m dive	Rock shelf, sponges
S2								
B1	26	Small island opposite Baird I., Slocum Arm Chichagof I.	57°33'N 136°01'W	HW			Dipnet, hand picking	Stones, creek mouth
F1				pel- agic	14.5	33.5	Dredge	Pelagic <u>Noctiluca</u>
S3								
B1	26	Chichagof I. at Trap Pt., Slocum Arm	57°33'N 136°01'W	LW			Inter- tidal, dipnet hand picking	Slatey stone shore outflow MW-HW
B2							Inter- tidal hand picking	Beneath kelp zone. LM-MW

S4 B1	27	Point Slocum at Potato Patch Pt., Chichagof I.	57°29'N 135°58'W	LW	c.12	Inter- tidal, dipnet, hand picking (as above)	Shelly sand; organic debris, LW
B2						(as above)	Freshwater stream outflow; sand. LW-I/3R
B3						(as above)	Sand and eel grass roots. LW and subtidal
B4		outer beach				(as above)	Bedrock and boulders, kelp and Phyllospadix. LW
B5						(as above)	Under stones and pebbles. LW
B6						(as above)	Under stones. MW
S5 B1	28	NW end Hegan I., small bay (1961 Str. 164) west cove	57°43'N 136°15'W	LW	14.0	Inter- tidal, dipnet, hand picking (as above)	Vertical slate bedrock Slaty gravel, organic de- bris
B2		west cove				(as above)	Bedrock and kelp. LW-sub- tidal
B3		east cove				(as above)	Fine black ripple sand; subtidal
B4		east cove				(as above)	Under stones in stream out- flow. LW-MHW
B5		east cove				(as above)	FW stream above tide. HW
B6		east cove				(as above)	Drift debris under gravel, logs. HW level
B7		west cove				(as above)	Under kelp and fucooids. LW-MW
B8		west cove				(as above)	On rocks under open stones. MW-LW
B9		east cove				(as above)	Bedrock and sand. LW
B10		east cove				(as above)	Under open stones. MW
B11		east cove				(as above)	Under open stones. MHW

TABLE VII. (cont'd)

STA- TION NO.	DATE.	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SAL'Y ‰/‰	DEPTH & SAMPLING METHOD	HABITAT
S6 L1	July 28	NW end Hogan I., mouth of Imperial Passage	57°43'N 136°16'W	LW- HR			LW-16 m dive	Sand, tube worms, hydroid clumps
L2							"	Stones, hydroid clumps; shallow subtidal
S7	29	Dry Pass, north end of Hill I., Chichagof I.	57°47'N 136°18'W	LW	c.15	30+		Vertically bedded meta- morphics
B1		west end					Dipnet, hand picking	Under boulders in kelp and algae. LW-MW
B2		west end					(as above) HW spray pools	
B2		west end					(as above) MHW among <u>Fucus</u> on bedrock	
B3		west end					(as above) LW-MW under stones	
B4		west end					(as above) MHW; in pools in fucoids	
B5		west end					(as above) MW-HW; under bare stones	
B6		west end					(as above) HW; under stones and pebbles	
B7		west end						
S8	29	Sea level slough, east side Fleming I., Chichagof I.	57°48'N 136°18'W	LW	c.15	30		Coarse sand, eel grass, algae on boulders. LW and subtidal
B1							Dipnet, hand picking	
B2					15+	<30	(as above) Sand and eel grass flats. LW-HR	
B3							(as above) Under stones in stream. MW-HW	

S9									
B1	29	Dry Pass, east end, Chichagof I.	57°04 $\frac{1}{2}$ 'N 136°17 $\frac{1}{2}$ 'W	LW				Dipnet, hand picking	Beel grass and shelly sand. LW-MW
S10									
Fl	29	Dry Pass, anchorage	57°04'N 136°17'W	LW				8 m Ekman	Black mud
S11									
B1	30	Column Pt., north end of Lisianski Strait, Chichagof I.,	58°06.4'N 136°27'W	LW	10.5	27.6		Dipnet, hand picking (as above) (as above) (as above) (as above)	Bedrock, boulders, kelp, LW and subtidal Pools, under stones. MW Fine black organic sand. LW and subtidal Under open boulders. MW-HW Under boulders. LW-MW
B2									
B3									
B4									
B5									
Fl								3-6 m dredge	Hard sand
S12									
B1	31	Black Bay, Chichagof I., mouth of Black R.	57°04 $\frac{1}{2}$ 'N 136°08'W	LW	13	c.25		Dipnet, hand picking (as above)	In rotting fucoids on sandy silt and gravel. MW FW stream outflow and marsh pools. HW
B2									
S13									
B1	31	Sister Lake, Chichagof I., head of east arm	57°03 $\frac{1}{2}$ 'N 135°59'W	LW HR	12.5	15		Dipnet, hand picking (as above) (as above)	Gravel and eel Grass. LW and subtidal Filamentous algae - under algal debris. HW Under stones. MW
B2									
B3									
Fl								0-3 m dredge	Gravel and algae

TABLE VII. (cont'd)

STA- TION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SALTY o/oo	DEPTH & SAMPLING METHOD	HABITAT
July								
S14 L1	31	Ogden Passage at entrance to Elbow Passage, Chichagof I.	57°37½'N 136°07½'W	LW- ½R			3-14 m dive	Sand and stone, hydroid clumps
S15 B1	31	Small I., W of Baird I., Khaz Bay, Chichagof I.	57°32½'N 136°03½'W	HW			Hand picking	Drift debris. HW, <u>Lepas</u> sp.
Aug.								
S16 B1	1	Sea Lion Cove, NW outer coast, Kruzof I. NW end of beach	57°18½'N 135°50'W	LW- ½R	11- 12	32+	Dipnet, hand picking	Surf sand beach On bedrock under algae at surf sand interface. LW and subtidal
B2							(as above)	Spray pools, above barnacles. HW+
B3							(as above)	Under rocks. LW+
B4							(as above)	Pools in sand near boulders. LW-MW
B5							(as above)	Under drift debris. HW
S17 F1	1	Kalinin Bay, inner cove, Kruzof I.	57°19'N 135°47'W		13	27.8	3-6 m dredge	Shell, mud, gravel
B1		outer delta					Dipnet, hand picking	Muddy gravel, <u>Zostera</u> , LW-MW

S18	2	Off Yamanoi Pt., beach Kruzof I., north end Sitka Sound	57°08'N 135°34'W	4P	Sand beach (<u>Siliqua</u>)
F1				11-3 m dredge	Fine silty sand
F2				6 m dredge	Fine sand and shell
F3				10 m dredge	Stones and algae on sand
B1		south end		Dipnet, hand picking	Conglomerate bedrock and <u>Phyllospadix</u> . LW
B2				(as above)	Under rocks. MW
<hr/>					
S19	2	Kamenoi Pt., Hayward Strait, Kruzof I.	57°08'N 135°33'W	14.6	Stones, algae, <u>Phyllospadix</u> on black sand. LW and sub- tidal
B1				Dipnet, hand picking	
B2				(as above)	Under boulders. LW-MW levels
B3				(as above)	Bedrock spray pools. HW
<hr/>					
S20	3	Rakof I., northern series at Dry Pass, Baranof I.	56°44'N 135°18'W		
B1		inner beach		LW 13.4 31.6	Under stones above <u>Fucus</u> . MW-MHW
B2				Dipnet, hand picking	
B3		outer beach		(as above)	Under stones in shelly bottom. LW and subtidal
B4				(as above)	In stream outflow under stones. MW-HW
B5				(as above)	Under stones in eel grass, stream mouth. LW and sub- tidal
B6		across bay from B5		(as above)	Gravel and shell, kelp. LW
				(as above)	Gravel, shell, woody debris. LW

TABLE VII. (cont'd)

STATION NO.	DATE	LOCALITY	LATITUDE LONGITUDE	TIDE	TEMP. °C	SAL. ‰	DEPTH & SAMPLING METHOD	HABITAT
S20	Aug.							
B7	3	Rakof I., northern series at Dry Pass, Baranof I. inner passage	56°44'N 135°18'W	LR			Dinner hand picking	On eel grass. LW
S21	3	Rakof I., mouth of first narrows anchorage, Baranof I.	56°45'N 135°18'W	LW			4½-13 m dive	Steep bedrock and boulders. Corraline algae, sponge, kelp.
S22	3	Rakof I., first narrows anchorage	56°45'N 135°19'W					
F1		south end near dry passage					1½ m dredge	Mud, shells
F2							6 m dredge	Mud, shells
F3							10 m dredge	Mud, shells
S23	4	Tafud I., south island beach opposite Koka I., Baranof I.	56°54'N 135°24'W	LR			4½-10 m dredge	Sand and kelp

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