

	Bank:	Heceta						Coquille								Daisy		
	Station:	1	2	3	4	5	6	1	2	3	4	5	6	7	8	1	2	3
	Year:	889	889	889	889	889	889	9	9	9	9	9	9	9	9	9	9	9
		890	890	890	890	890	890	0	0	0	0	0	0	0	0	0	0	0
Class Hexactinellida																		
Aphrocallistes-like (vase sponge)														X	X	X	X	X
Aphrocallistes/Mycale (vase sponge)														X	X	X	X	X
Staurocalyptus-like (barrel sponge)														X	X	X	X	X
Class Demospongia																		
Geodia-like (stout vase sponge)														X		X		
Mycale-like (funnel sponge)														X	X	X	X	X
Pachastrellidae-like (shelf sponge)														X	X	X	X	X
Phylum Cnidaria (anemones, hydrozids, and corals)																		
Class Hydrozoa																		
Allopora californica (hydrocoral)																		
Class Anthozoa																		
Actinostola sp.																		X
Actiniidae		X						X						X	X	X		
Anthomastus ritteri (?)														X	X	X		X
Balticinia (Pavonaria) sp. (sea pen)								X						X	X			
Cerianthid anemone																		
Cibrinopsis sp. (?)																		
Corallimorphus (?)																		
Gorgonacea														X	X			X
Lophogorgia-like													X	X	X	X		X
Metridium senile (plumose anemone)																X		
Pennatula sp.																X		
Ptylosarcos sp. (sea pen)																		
Stomphia coccinea																		
Stomphia sp.																X	X	X
Stylatula elongata (sea pen)														X		X		X
Swiftia sp.														X	X	X	X	X
unknown tan zoanthid																		X
Urticina piscivora																		
Virgularia sp.								X		X				X		X		
Zoanthinaria																		X
Phylum Ectoprocta (bryzoans)																		
Heteropora magna (?)																		
Phylum Brachiopoda (lamp shells)																		
Crania californica																		X
Laqueus californianus																		X
Terebratulida														X	X	X	X	X
Phylum Mollusca																		
Class Gastropoda (snails and sea slugs)																		
Antiplanes sp. (?)																		
Archidoris odhneri														X	X	X	X	X
Archidoris odhneri/Discodoris																		
Buccinidae													X		X	X		X
Dendrodonis sp.																		X
Dendronotus dalli																		
Dirona albolineata														X	X	X		
Fusitriton oregonensis (Oregon triton)														X	X	X	X	X
Neogastropoda																		
Neptunea sp.																		
Neptunea/Neptuneidae																		
Tritonia sp.																		
Tritonia festiva														X		X		
Tritonia diomedea																		X

	Heceta						Coquille								Daisy		
Bank:	1	2	3	4	5	6	1	2	3	4	5	6	7	8	1	2	3
Station:	889	889	889	889	889	889	9	9	9	9	9	9	9	9	9	9	9
Year:	890	890	890	890	890	890	0	0	0	0	0	0	0	0	0	0	0
Trophoninae unidentified snail										X	X	X		X			X
Class Cephalopoda (octopus and squid)																	
Octopus dofleini (Pacific giant octopus)																	
Octopus rubescens																	
Octopus sp.																	
Opisthoteuthis californica (squid)																	
Rossia pacifica (cuttlefish)																	
Phylum Arthropoda																	
Class Crustacea (crabs and shrimp)																	
Acantholithodes hispidus																	
Cancer sp. (rock crabs)																	
Chorilia longipes																	
Lopholithodes foraminatus																	
Munida quadrispina																	
Pandalus jordani																	
Pandalus platyceros																	
Pandalus sp.																	
unknown pagurids																	
unknown galatheid																	
Phylum Echinodermata																	
Class Crinoidea (crinoids)																	
Florometra serrastissima																	
Class Holothuroidea (sea cucumbers)																	
Parastichopus californicus																	
Parastichopus spp.																	
Psolus spp.																	
Class Echinoidea (urchins)																	
Allocentrotus fragilis																	
Brissaster sp.																	
Class Asteroidea (seastars)																	
Ceremaster patagonicus																	
Crossaster papposus																	
Ctenodiscus crispatus																	
Dermasterias imbricata																	
Evasterias troschelii																	
Gephyreaster swifti																	
Henricia sp.																	
Henricia spp.																	
Hippasterias sp.																	
Lophaster/Asterias																	
Luidia foliolata																	
Mediaster aequalis																	
Orthasterias koehleri																	
Patiria miniata																	
Peridontaster crassus																	
Poraniopsis inflata																	

Pteraster militaris
Pteraster spp.
Pteraster tessellatus
Pycnopodia helianthoides
Pycnopodia/Rathbunaster
Rathbunaster californicus
Solaster sp.
Stylasterias forreri
Stylasterias/Orthasterias

Asteronyx loveni
Gorgonocephalus eucinemis
Ophiacantha sp.
Ophiura sarsii
Ophiurida sp.

Corella spetalatis
Cystodytes lobatus
Salpa fusiformis
Trididemnum sp.

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APPENDIX 2

Master list of dives by *DSV Delta* at Heceta Bank during 1988 to 1990, and at Coquille and Daisy Banks during 1990.

Dive Code	Delta Dive Code	Date	Start-End Time	Transect Length (m)	Depth		Observer	Pilot	Remarks
					Max	Min			
FISH TRANSECTS:									
1988 Heceta Bank:									
88H1A	1259	9/03/88	0924-1101	2289	290	241	Hixon	R.Slater	
88H1B	1260	9/03/88	1152-1322	2237	295	250	Stein	R.Slater	
88H1C	1261	9/03/88	1415-1544	2026	315	250	Barss	R.Slater	
88H2A	1263	9/04/88	0845-1009	2132	845	530	Stein	R.Slater	
88H2B	1264	9/04/88	1215-1357	1750	700	520	Barss	R.Slater	
88H2C	1265	9/04/88	1440-1616	1671	670	520	Hixon	R.Slater	
88H3A	1267	9/05/88	1141-1255	2118	436	240	Barss	R.Slater	
88H3B	1268	9/05/88	1344-1515	2289	450	248	Stein	R.Slater	
88H3C	1269	9/05/88	1555-1720	2250	452	235	Hixon	R.Slater	
88H4A	1276	9/12/88	0822-0948	1816	425	397	Barss	R.Slater	
88H4B	1277	9/12/88	1039-1209	2039	415	385	Hixon	R.Slater	
88H4C	1278	9/12/88	1326-1449	2039	420	400	Stein	R.Slater	
88H5A	1271	9/06/88	1021-1255	2250	1030	980	Hixon	R.Slater	
88H5B	1272	9/06/88	1256-1447	2645	1025	950	Stein	R.Slater	
88H5C	1273	9/06/88	1532-1719	1868	1000	915	Barss	R.Slater	
88H6A	1274	9/07/88	1135-1328	1579	1200	460	Stein	R.Slater	
88H6B	1275	9/07/88	1406-1602	1776	1200	460	Hixon	R.Slater	
88H6C	1281	9/14/88	0852-1041	1882	1175	460	Barss	R.Slater	
1989 Heceta Bank:									
89H1A	1511	9/02/89	1056-1214	1895	255	240	Barss	Wicklund	
89H1B	1512	9/02/89	1402-1519	934	250	230	Hixon	D.Slater	strong
89H2A	1513	9/09/89	1110-1231	1855	495	450	Stein	Wicklund	
89H2B	1514	9/03/89	1351-1508	1737	510	455	Barss	D.Slater	
89H3A	1515	9/03/89	1805-1916	934	300	240	Hixon	D.Slater	ballast
89H3B	1517	9/09/89	1314-1438	2224	350	240	Stein	Wicklund	
89H4A	1524	9/08/89	1131-1247	1184	430	418	Hixon	D.Slater	gyro-
89H4B	1525	9/09/89	1343-1459	1947	440	410	Stein	Wicklund	
89H5A	1521	9/09/89	1813-1915	1618	1000	850	Stein	Wicklund	strong
89H5B	1523	9/08/89	0745-0904	1632	970	550	Barss	D.Slater	
89H6A	1518	9/04/89	1652-1809	1513	950	460	Barss	D.Slater	
89H6B	1519	9/05/89	1407-1522	2092	1160	460	Hixon	Wicklund	
1990 Heceta Bank:									
90H1A	2097	9/17/90	1538-1645	1895	291	231	Hixon	D.Slater	
90H1B	2098	9/17/90	1733-1845	1947	280	220	Barss	Wicklund	
90H2A	2095	9/17/90	0933-1108	2381	525	488	Barss	D.Slater	
90H2B	2096	9/17/90	1211-1329	2474	520	480	Stein	Wicklund	
90H3A	2089	9/16/90	0855-1012	2224	440	240	Stein	Wicklund	
90H3B	2090	9/16/90	1141-1254	1039	455	250	Hixon	D.Slater	audio
90H3B	2093	9/17/90	1903-1940	1158	338	338	Hixon	D.Slater	repla
90H4A	2099	9/18/90	0831-0943	1934	420	375	Stein	Wicklund	
90H4B	2100	9/18/90	1036-1156	2197	436	395	Hixon	D.Slater	
90H5A	2102	9/18/90	1600-1811	2184	1200	1009	Barss	D.Slater	
90H5B	2106	9/23/90	0754-0908	2210	1010	730	Stein	Wicklund	
90H6A	2103	9/22/90	1321-1433	1763	1180	445	Hixon	Wicklund	strong
90H6B	2104	9/22/90	1553-1703	1737	1175	474	Barss	D.Slater	
1990 Coquille Bank:									
90C1	2108	9/23/90	1820-1933	2579	705	600	Barss	Wicklund	
90C2	2109	9/24/90	0840-0953	2974	400	345	Stein	Wicklund	
90C3	2110	9/24/90	1046-1217	2421	502	388	Hixon	D.Slater	
90C4	2115	9/25/90	1118-1225	868	484	477	Barss	D.Slater	strong
90C5A	2107	9/23/90	1556-1708	2447	672	483	Hixon	D.Slater	
90C5B	2123	9/26/90	1549-1702	2737	685	475	Barss	Wicklund	
90C6A	2112	9/24/90	1645-1601	2592	1180	900	Stein	Wicklund	
90C6B	2122	9/26/90	1315-1427	2276	1184	905	Hixon	D.Slater	
90C7A	2111	9/24/90	1301-1429	2197	575	383	Barss	D.Slater	
90C7B	2121	9/26/90	1058-1211	2671	700	360	Stein	Wicklund	
90C8A	2114	9/25/90	0831-0957	2395	620	505	Hixon	Wicklund	
90C8B	2120	9/26/90	0820-0932	2776	649	500	Barss	D.Slater	

Dive Code	Delta Dive Code	Date	Start-End Time	Transect Length (m)	Depth		Observer	Pilot	Remarks
					Max	Min			
1990 Daisy Bank:									
90D1A	2125	9/27/90	0835-0946	2176	570	477	Hixon	D.Slater	
90D1B	2129	9/28/90	0835-0947	2853	600	470	Barss	Wicklund	
90D2A	2126	9/27/90	1050-1204	2176	700	425	Stein	Wicklund	
90D2B	2131	9/28/90	1150-1301	1529	720	430	Hixon	D.Slater	gyro-compass failure
90D3A	2127	9/27/90	1318-1432	2338	620	460	Barss	D.Slater	
90D3B	2132	9/28/90	1400-1512	2485	610	480	Stein	Wicklund	

YELLOWTAIL ROCKFISH TRACKING:

-----	1262	9/03/88	1800-1909	----	250	200	Pearcy	R.Slater	
-----	1266	9/05/88	0929-1057	----	240	222	Pearcy	R.Slater	
-----	1282	9/14/88	1755-1852	----	600	573	Pearcy	R.Slater	
-----	1516	9/04/89	1025-1200	----	240	240	Pearcy	Wicklund	
-----	1522	9/08/89	0600-0700	----	240	200	Pearcy	Wicklund	
-----	2092	9/16/90	1653-1743	----	300	270	Pearcy	Wicklund	

INVERTEBRATE OBSERVATIONS & COLLECTIONS:

-----	1279	9/12/88	1530-1430	----	275	250	Tissot	R.Slater	
-----	2091	9/16/90	1404-1553	----	350	250	Benech	D.Slater	
-----	2101	9/18/90	1239-1417	----	415	380	Benech	Wicklund	
-----	2105	9/22/90	1816-1910	----	620	460	Tissot	Wicklund	
-----	2116	9/25/90	1337-1444	----	608	590	Benech	Wicklund	
-----	2117	9/25/90	1553-1722	----	411	396	Benech	D.Slater	
-----	2124	9/26/90	1803-1846	----	470	470	Tissot	D.Slater	
-----	2128	9/27/90	1542-1642	----	475	470	Benech	Wicklund	
-----	2133	9/28/90	1610-1618	----	445	440	Tissot	D.Slater	

MISCELLANEOUS:

-----	1270	9/06/88	0900-1000	----	900	850	Brewer	R.Slater	VIP dive
-----	1280	9/12/88	1500-1600	----	275	250	Crew	R.Slater	equipment check-out
-----	2094	9/17/90	0837-0900	----	---	---	Barss	D.Slater	aborted: trackpoint failure
-----	2113	9/24/90	1630-1730	----	350	350	Crew	D.Slater	equipment check-out
-----	2118	9/25/90	1800-1830	----	375	375	Crew	Wicklund	equipment check-out
-----	2119	9/25/90	1845-1915	----	375	375	Crew	Wicklund	equipment check-out
-----	2130	9/28/90	1044-1100	----	---	---	Hixon	D.Slater	aborted: wrong location

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APPENDIX 3

Summaries of the abundances of fishes, invertebrates, other organisms, and bottom types sampled during submersible transects at all banks, listed in the same order as Appendix 2. "Schooling" refers to fishes occurring in polarized aggregations of more than 10 individuals. "Richness (S)" is the total number of identifiable species on a transect, "evenness (J)" is a measure of the equitability of relative abundances of species or bottom types, and "diversity (H')" is the Shannon-Weiner index, a composite measure of richness and evenness (see Magurran 1988). See Chapter 2 (General Methods) for definitions of bottom type, cover, and patch.

Dive Code: 1988 Heceta Bank, Station 1, Dive A (88H1A)

Delta Dive: 1259

Date: 9/03/88

Time: 0934-1037

Minimum Depth: 241 ft (73 m)

Maximum Depth: 290 ft (88 m)

Remarks: mid-transect temperature = 7.2 C

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes</u> sp. (juvenile)	1143.5	28.5	1115.0	---	---	---	---	---
<u>Sebastes</u> <u>helvomaculatus</u>	172.8	---	15.2	136.8	20.9	---	---	---
<u>Sebastes</u> <u>elongatus</u>	83.6	---	66.5	17.1	---	---	---	---
<u>Radulinus</u> <u>asprellus</u>	49.4	---	49.4	---	---	---	---	---
<u>Ophiodon</u> <u>elongatus</u>	19.0	---	---	---	---	---	7.6	11.4
<u>Rathbunella</u> sp.	19.0	---	19.0	---	---	---	---	---
<u>Hexagrammos</u> <u>decagrammus</u>	9.5	---	---	---	1.9	5.7	1.9	---
<u>Coryphopterus</u> <u>nicholsii</u>	9.5	3.8	5.7	---	---	---	---	---
<u>Raja</u> <u>binoculata</u>	3.8	---	---	---	---	---	1.9	1.9
<u>Sebastes</u> <u>ruberrimus</u>	3.8	---	---	---	---	1.9	1.9	---
<u>Sebastes</u> <u>wilsoni</u>	3.8	---	1.9	1.9	---	---	---	---
<u>Raja</u> sp.	1.9	---	---	---	---	---	1.9	---
<u>Sebastes</u> <u>flavidus</u>	1.9	---	---	---	---	1.9	---	---
<u>Sebastes</u> <u>paucispinis</u>	1.9	---	---	---	1.9	---	---	---
<u>Sebastes</u> <u>pinniger</u>	1.9	---	---	---	---	---	1.9	---
unknown mottled sculpin	1.9	---	1.9	---	---	---	---	---

SCHOOLING FISHES:

<u>Sebastes</u> sp. (juvenile)	1077.0	3.8	1073.2	---	---	---	---	---
--------------------------------	--------	-----	--------	-----	-----	-----	-----	-----

ALL FISHES:

Total density: 2604.1

Diversity indices: Richness (S) = 15 Evenness (J) = 0.58 Diversity (H') = 1.55

INVERTEBRATES: species present

Allocentrotus fragilis
Ceremaster patagonicus
Florometra serratissima
Gorgonocephalus eucinemis
Henricia spp.
Hippasterias sp.
Lophaster/Asterias
Luidia foliolata
Mediaster aequalis
Ophiacantha sp.
Parastichopus spp.
Pycnopodia helianthoides
Rathbunaster californicus
Solaster sp.
Stylasterias forreri
Swiftia spp.
unknown foliose sponge
unknown vase sponge
Urticina piscivora

OTHER ORGANISMS PRESENT:

Beggiotoa spp. (bacterial mat)
Codium sp.
unknown crustose red alga

(Dive 88H1A continued)

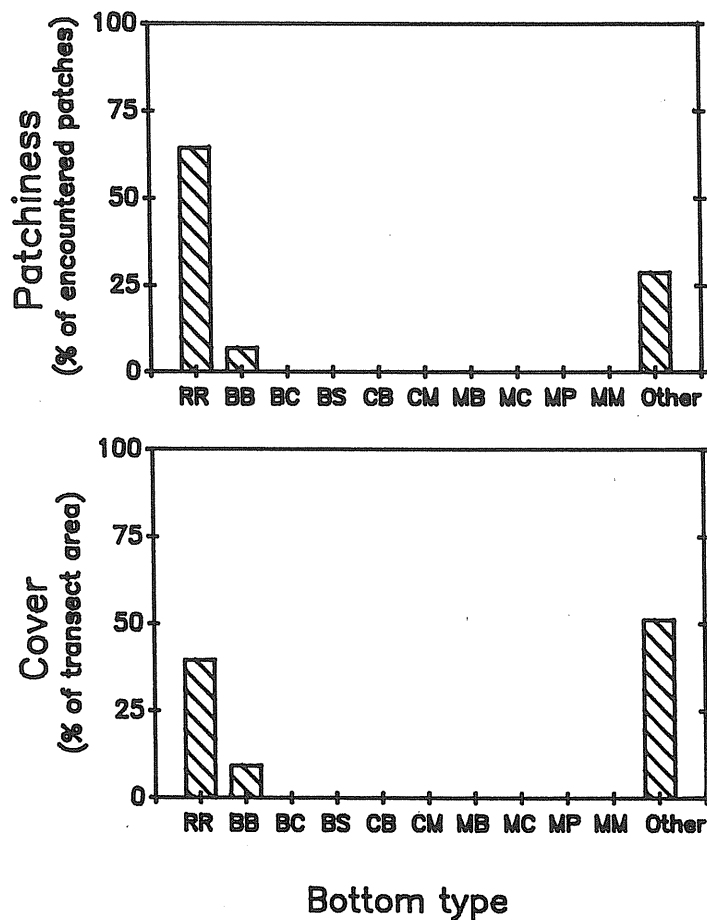
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
RR	Rock Ridge	64.4	39.5
CC	Cobble	14.5	18.6
SS	Sand	7.8	16.3
BB	Boulder	6.9	9.3
BF	Boulder + Flat rock	4.3	7.0
SC	Sand + Cobble	2.2	9.3

Richness (S) = 6

Patchiness: Evenness (J) = 0.89 Diversity (H') = 1.60

Cover: Evenness (J) = 0.65 Diversity (H') = 1.16



Dive Code: Dive Code: 1988 Heceta Bank, Station 1, Dive B (88H1B)

Delta Dive: 1260

Date: 9/03/88

Time: 1202-1314

Minimum Depth: 235 ft (72 m)

Maximum Depth: 295 ft (90 m)

Remarks: Temperature 7.2-7.4 C

Estimated density (#/hectare) by total length

Scientific Name	Total	0 dm	1 dm	2 dm	3 dm	4 dm	5 dm	≥ 5 dm
-----------------	-------	------	------	------	------	------	------	--------

NON-SCHOOLING FISHES:

<u>Sebastes</u> sp.(juvenile)	3585.7	4149.6	9228.2	206.0	1.9	---	---	---
<u>Sebastes helvomaculatus</u>	153.5	---	19.4	106.9	27.2	---	---	---
<u>Sebastes flavidus</u>	60.3	---	---	---	---	60.3	---	---
unknown fish	19.4	---	---	---	---	19.4	---	---
<u>Ophiodon elongatus</u>	13.6	---	---	3.9	1.9	5.8	---	1.9
<u>Hexagrammos decagrammus</u>	9.7	---	---	5.8	3.9	---	---	---
unknown blenny-like fish	9.7	---	9.7	---	---	---	---	---
<u>Sebastes ruberrimus</u>	5.8	---	1.9	1.9	---	1.9	---	---
<u>Raja rhina</u>	3.9	---	---	---	---	---	---	3.9
<u>Sebastes pinniger</u>	3.9	---	---	1.9	---	1.9	---	---
<u>Radulinus asprellus</u>	3.9	---	3.9	---	---	---	---	---
<u>Rathbunella</u> sp.	3.9	---	3.9	---	---	---	---	---
<u>Citharichthys</u> sp.	3.9	---	3.9	---	---	---	---	---
unknown flatfish	1.9	---	---	---	1.9	---	---	---
<u>Hydrolagus colliei</u>	1.9	---	---	---	---	1.9	---	---
<u>Sebastes elongatus</u>	1.9	---	---	---	1.9	---	---	---
unknown mottled sculpin	1.9	---	1.9	---	---	---	---	---

SCHOOLING FISHES:

<u>Sebastes</u> sp.(juvenile)	13508.0	4130.1	9173.8	204.1	---	---	---	---
<u>Sebastes flavidus</u>	58.3	---	---	---	---	58.3	---	---

ALL FISHES:

Total density: 27451.4

Diversity indices: Richness (S) = 15 Evenness (J) = 0.54 Diversity (H') = 1.47

INVERTEBRATES: (86.6 % of videotape usable)

	Estimated density (#/hectare)
<u>Scypha/Iophon</u>	27764.3
<u>Pachastrellidae-like</u>	4450.8
<u>Aphrocallistes-like</u>	1902.8
<u>Florometra serrastissima</u>	684.1
<u>Parastichopus</u> spp.	606.4
<u>Ophiacantha</u> sp.	165.2
<u>Henricia</u> sp.	139.9
<u>Gorgonocephalus eucinemis</u>	46.6
<u>Gephyreaster/Mediaster</u>	35.0
<u>Pycnopodia/Rathbunaster</u>	33.0
<u>Hippasterias</u> spp.	29.2
<u>Mediaster aequalis</u>	25.3
<u>Henricia</u> spp.	9.7
<u>Pteraster</u> spp.	9.7
<u>Allocentrotus fragilis</u>	3.9
<u>Archidoris odhneri</u>	3.9
<u>Gephyreaster swifti</u>	3.9
<u>Metridium senile</u>	3.9

Diversity indices: Richness (S) = 18 Evenness (J) = 0.29 Diversity (H') = 0.85

OTHER ORGANISMS PRESENT:

Beggiotoa spp. (bacterial mat)
Encrusting Red Algae

(Dive 88H1B continued)

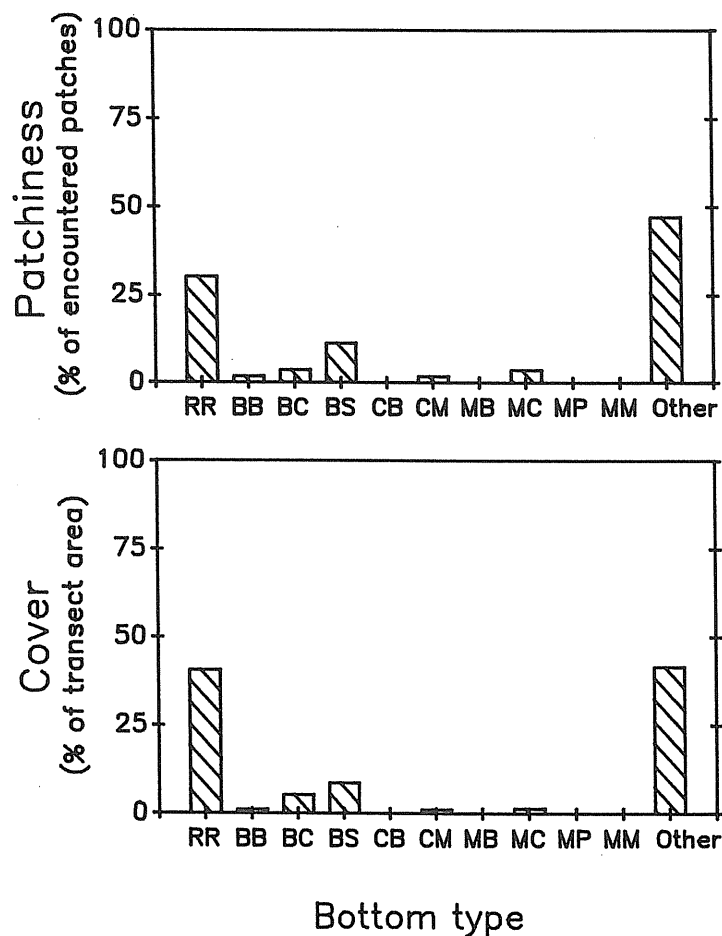
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
RR	Rock Ridge	40.6	30.2
BM	Boulder + Mud	10.8	9.4
SC	Sand + Cobble	9.7	9.4
BS	Boulder + Sand	8.7	11.3
CP	Cobble + Pebble	5.5	1.9
RB	Rock Ridge + Boulder	5.3	5.7
BC	Boulder + Cobble	5.3	3.8
CS	Cobble + Sand	4.3	7.5
FF	Flat Rock	2.2	5.7
RC	Rock Ridge + Cobble	1.7	3.8
MC	Mud + Cobble	1.5	3.8
SB	Sand + Boulder	1.2	1.9
BB	Boulder	1.2	1.9
CM	Cobble + Mud	1.2	1.9
SS	Sand	0.9	1.9

Richness (S) = 15

Patchiness: Evenness (J) = 0.86 Diversity (H') = 2.32

Cover: Evenness (J) = 0.76 Diversity (H') = 2.07



Dive Code: 1988 Heceta Bank, Station 1, Dive C (88H1C)

Delta Dive: 1261

Date: 9/03/88

Time: 1425-1535

Minimum Depth: 240 ft (73 m)

Maximum Depth: 315 ft (96 m)

Remarks: Temperature 7.3 C at mid-transect

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes sp.(juvenile)</u>	4774.9	4774.9	---	---	---	---	---	---
<u>Sebastes wilsoni</u>	2309.1	---	2309.1	---	---	---	---	---
<u>Sebastes helvomaculatus</u>	227.5	2.1	167.4	51.5	6.4	---	---	---
<u>Sebastes flavidus</u>	225.3	---	---	4.3	218.9	2.1	---	---
<u>Sebastes pinniger</u>	66.5	2.1	---	---	64.4	---	---	---
<u>Hexagrammos decagrammus</u>	15.0	---	---	8.6	6.4	---	---	---
<u>Sebastes ruberrimus</u>	10.7	---	---	---	2.1	8.6	---	---
unknown fish	6.4	---	6.4	---	---	---	---	---
<u>Sebastes elongatus</u>	4.3	---	---	4.3	---	---	---	---
<u>Ophiodon elongatus</u>	4.3	---	---	---	2.1	2.1	---	---
<u>Raja rhina</u>	2.1	2.1	---	---	---	---	---	---
<u>Sebastes proriger</u>	2.1	---	---	2.1	---	---	---	---

SCHOOLING FISHES:

<u>Sebastes sp.(juvenile)</u>	4774.9	4774.9	---	---	---	---	---	---
<u>Sebastes wilsoni</u>	2300.5	---	2300.5	---	---	---	---	---
<u>Sebastes flavidus</u>	193.1	---	---	---	193.1	---	---	---
<u>Sebastes pinniger</u>	64.4	---	---	---	64.4	---	---	---

ALL FISHES:

Total density: 15002.8

Diversity indices: Richness (S) = 10 Evenness (J) = 0.22 Diversity (H') = 0.65

INVERTEBRATES: (83.5 % of videotape usable)

	Estimated density (#/hectare)
<u>Scypha/Iophon</u>	29213.7
<u>Ophiacantha</u> sp.	4139.7
<u>Florometra serratissima</u>	1000.0
<u>Parastichopus</u> spp.	635.2
<u>Henricia</u> sp.	133.1
<u>Allocentrotus fragilis</u>	124.5
<u>Gorgonocephalus eucinemis</u>	42.9
<u>Pycnopodia/Rathbunaster</u>	30.0
<u>Archidoris odhneri</u>	21.5
<u>Hippasterias</u> spp.	21.5
<u>Pteraster</u> spp.	17.2
<u>Hippasterias/Pteraster</u>	15.0
<u>Mediaster aequalis</u>	15.0
<u>Lophogorgia</u> -like	10.7
<u>Luidia foliolata</u>	10.7
<u>Octopus dofleini</u>	6.4
white fennistrate sponge	6.4
<u>Gephyreaster swifti</u>	2.1

Diversity indices: Richness (S) = 18 Evenness (J) = 0.23 Diversity (H') = 0.67

OTHER ORGANISMS PRESENT:

Beggiotoa spp. (bacterial mat)
Encrusting Red Algae

(Dive 88H1C continued)

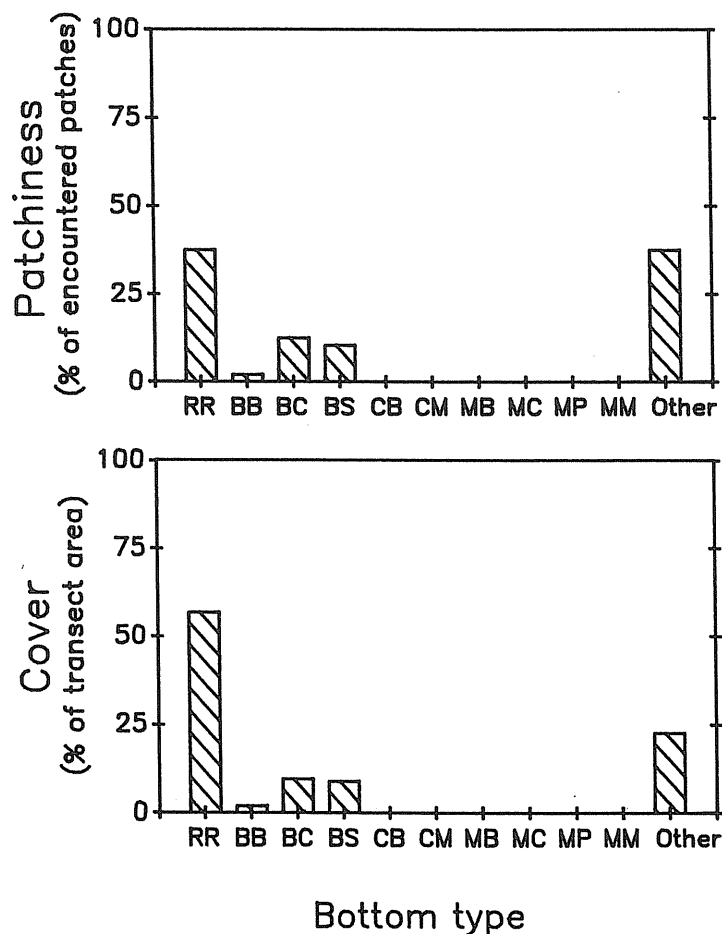
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
RR	Rock Ridge	56.7	37.5
BC	Boulder + Cobble	9.7	12.5
BS	Boulder + Sand	9.0	10.4
SC	Sand + Cobble	5.2	6.3
RB	Rock Ridge + Boulder	3.7	2.1
BR	Boulder + Rocky Ridge	3.5	8.3
CP	Cobble + Pebble	2.8	2.1
CS	Cobble + Sand	2.2	4.2
BB	Boulder	2.0	2.1
FF	Flat Rock	2.0	2.1
CC	Cobble	1.8	4.2
SB	Sand + Boulder	1.2	6.3
FC	Flat Rock + Cobble	0.3	2.1

Richness (S) = 13

Patchiness: Evenness (J) = 0.81 Diversity (H') = 2.08

Cover: Evenness (J) = 0.64 Diversity (H') = 1.64



Dive Code: 1988 Heceta Bank, Station 2, Dive A (88H2A)

Delta Dive: 1263

Date: 9/04/88

Time: 0859-1009

Minimum Depth: 530 ft (161 m)

Maximum Depth: 845 ft (257 m)

Remarks: A lot of trawl marks; temperature 6.2-6.4 C; poor visibility

Estimated density (#/hectare) by total length

Scientific Name	Total	0 dm	1 dm	2 dm	3 dm	4 dm	5 dm	≥ 5 dm
NON-SCHOOLING FISHES:								
<u>Sebastes</u> sp. (juvenile)	261.0	---	6.1	155.0	95.8	4.1	---	---
<u>Microstomus pacificus</u>	206.0	---	12.2	114.2	46.9	30.6	2.0	---
unknown small flatfish	189.7	2.05	1.0	95.8	38.7	2.0	---	---
<u>Lycodes corteziianus</u>	75.5	---	14.3	40.8	14.3	6.1	---	---
<u>Glyptocephalus zachirus</u>	69.3	---	---	32.6	28.6	8.2	---	---
unknown mottled sculpin	51.0	---	8.2	34.7	8.2	---	---	---
unknown mottled poacher	48.9	---	2.0	44.9	2.0	---	---	---
<u>Sebastes elongatus</u>	46.9	---	---	10.2	32.6	4.1	---	---
<u>Parophrys vetulus</u>	42.8	---	2.0	18.4	14.3	8.2	---	---
<u>Sebastes helvomaculatus</u>	40.8	---	---	22.4	14.3	4.1	---	---
<u>Eopsetta jordani</u>	38.7	---	---	32.6	6.1	---	---	---
unknown flatfish	26.5	---	8.2	14.3	2.0	2.0	---	---
<u>Raja kincaidii</u>	24.5	---	---	12.2	10.2	---	---	2.0
<u>Sebastes proriger</u>	24.5	---	---	16.3	8.2	---	---	---
<u>Sebastolobus alascanus</u>	12.2	---	---	2.0	10.2	---	---	---
unknown fish	10.2	---	---	6.1	2.0	2.0	---	---
<u>Sebastes crameri</u>	8.2	---	---	---	4.1	4.1	---	---
<u>Sebastes</u> sp. (large)	8.2	---	2.0	6.1	---	---	---	---
<u>Lyopsetta exilis</u>	6.1	---	---	4.1	2.0	---	---	---
<u>Raja binoculata</u>	4.1	---	---	---	2.0	---	---	2.0
unknown blenny-like fish	4.1	---	---	4.1	---	---	---	---
<u>Hydrolagus colliei</u>	2.0	---	---	---	---	---	2.0	---
<u>Sebastes</u> sp. (blotched)	2.0	---	---	---	2.0	---	---	---
<u>Icelinus filamentosus</u>	2.0	---	---	---	2.0	---	---	---
<u>Agonus acipenserinus</u>	2.0	---	---	2.0	---	---	---	---
<u>Careproctus melanurus</u>	2.0	---	---	---	2.0	---	---	---
<u>Citharichthys</u> sp.	2.0	---	2.0	---	---	---	---	---

SCHOOLING FISHES:

<u>Sebastes proriger</u>	2.0	---	---	---	2.0	---	---	---
--------------------------	-----	-----	-----	-----	-----	-----	-----	-----

ALL FISHES:

Total density: 1213.4

Diversity indices: Richness (S) = 23 Evenness (J) = 0.64 Diversity (H') = 2.00

INVERTEBRATES: species present

Allocentrotus fragilis

Corolla spetulatis

Luidia foliolata

Parastichopus californicus

Rathbunaster californicus

(Dive 88H2A continued)

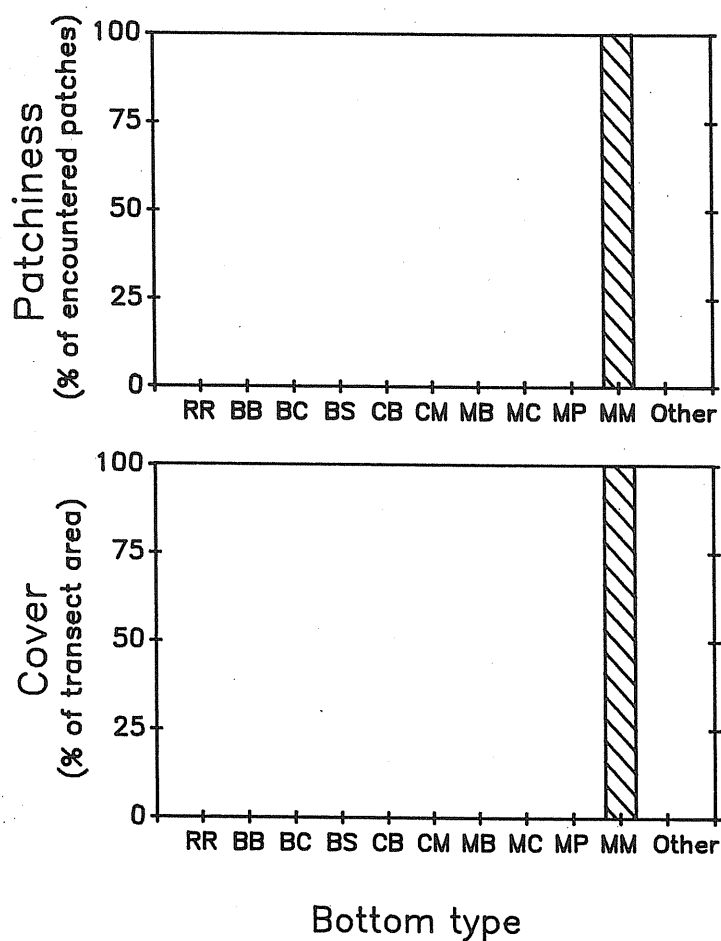
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
MM	Mud	100.0	100.0

Richness (S) = 1

Patchiness: Evenness (J) = 0 Diversity (H') = 0

Cover: Evenness (J) = 0 Diversity (H') = 0



Dive Code: 1988 Heceta Bank, Station 2, Dive B (88H2B)

Delta Dive: 1264

Date: 9/04/88

Time: 1229-1342

Minimum Depth: 520 ft (158 m)

Maximum Depth: 700 ft (213 m)

Remarks: Poor visibility

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes zacentrus</u>	807.5	---	173.9	355.3	278.3	---	---	---
<u>Sebastes wilsoni</u>	556.5	---	534.2	22.4	---	---	---	---
<u>Lyopsetta exilis</u>	129.2	---	62.1	64.6	2.5	---	---	---
<u>Microstomus pacificus</u>	91.9	---	39.8	29.8	14.9	7.5	---	---
<u>Lycodes cortezianus</u>	87.0	---	29.8	47.2	9.9	---	---	---
<u>Sebastes helvomaculatus</u>	59.6	---	39.8	19.9	---	---	---	---
<u>Glyptocephalus zachirus</u>	54.7	---	14.9	32.3	7.5	---	---	---
<u>Sebastes elongatus</u>	44.7	---	5.0	22.4	17.4	---	---	---
unknown mottled poacher	29.8	---	19.9	9.9	---	---	---	---
<u>Icelinus filamentosus</u>	17.4	---	9.9	5.0	2.5	---	---	---
unknown mottled sculpin	14.9	---	9.9	5.0	---	---	---	---
<u>Eptatretus sp.</u>	12.4	---	---	---	9.9	2.5	---	---
<u>Raja kincaidii</u>	9.9	---	---	---	5.0	5.0	---	---
<u>Anoplopoma fimbria</u>	5.0	---	---	---	---	2.5	---	2.5
<u>Eopsetta jordani</u>	5.0	---	5.0	---	---	---	---	---
<u>Parophrys vetulus</u>	5.0	---	2.5	---	2.5	---	---	---
unknown flatfish	2.5	---	2.5	---	---	---	---	---
<u>Squalus acanthias</u>	2.5	---	---	---	---	---	---	2.5
<u>Raja rhin</u>	2.5	---	---	---	2.5	---	---	---
<u>Sebastes paucispinis</u>	2.5	---	---	---	---	---	---	2.5
<u>Sebastes sp.</u>	2.5	---	2.5	---	---	---	---	---
SCHOOLING FISHES:								
<u>Sebastes zacentrus</u>	646.0	---	119.3	278.3	248.4	---	---	---
<u>Sebastes wilsoni</u>	246.0	---	246.0	---	---	---	---	---
ALL FISHES:								
Total density:	2834.8							
Diversity indices:	Richness (S) = 19	Evenness (J) = 0.59		Diversity (H') = 1.75				

INVERTEBRATES: (100.0 % of videotape usable)

	Estimated density (#/hectare)
<u>Ophiacantha</u> sp.	765.2
<u>Scypha/Iophon</u>	72.0
<u>Allocentrotus fragilis</u>	37.3
Pachastrellidae-like	37.3
<u>Luidia foliolata</u>	17.4
<u>Ophiura sarsii</u>	14.9
<u>Swiftia</u> sp.	14.9
<u>Archidoris odhneri</u>	12.4
<u>Henricia</u> sp.	9.9
<u>Salpa fusiformis</u>	7.5
pagurids	5.0
<u>Poraniopsis inflata</u>	2.5
<u>Pteraster</u> spp.	2.5
<u>Pycnopodia/Rathbunaster</u>	2.5
<u>Staurocalyptus</u> -like	2.5

Diversity indices: Richness (S) = 15 Evenness (J) = 0.39 Diversity (H') = 1.06

OTHER ORGANISMS PRESENT:

Beggiotoa spp. (bacterial mat)

(Dive 88H2B continued)

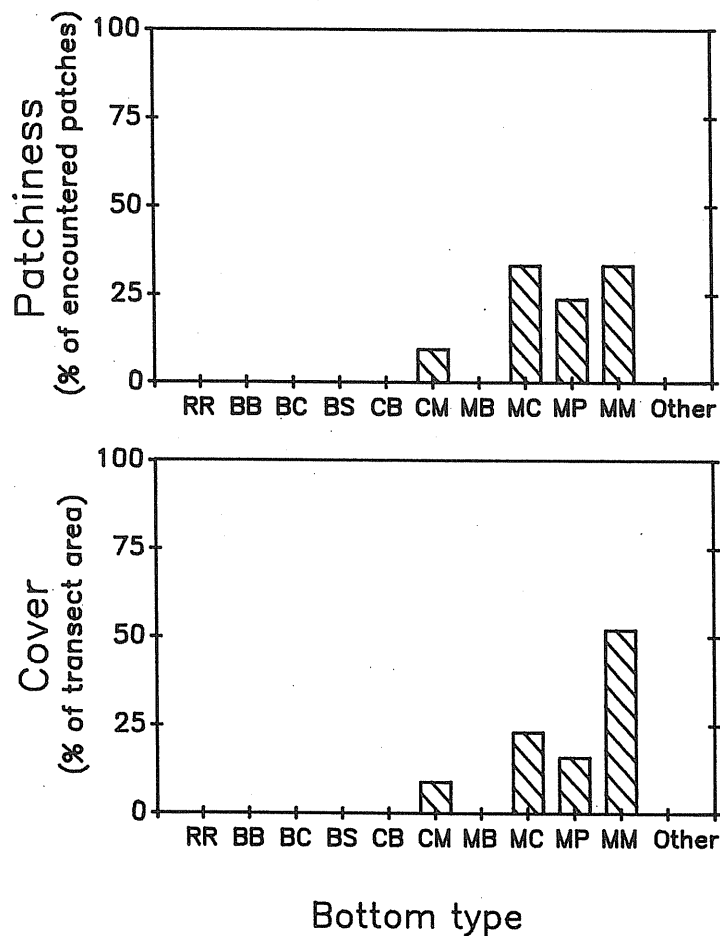
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
MM	Mud	52.0	33.3
MC	Mud + Cobble	23.1	33.3
MP	Mud + Pebble	15.9	23.8
CM	Cobble + Mud	9.0	9.5

Richness (S) = 4

Patchiness: Evenness (J) = 0.94 Diversity (H') = 1.30

Cover: Evenness (J) = 0.86 Diversity (H') = 1.19



Dive Code: 1988 Heceta Bank, Station 2, Dive C (88H2C)

Delta Dive: 1265

Date: 9/04/88

Time: 1449-1559

Minimum Depth: 520 ft (158 m)

Maximum Depth: 670 ft 204 m)

Remarks: Temperature 6.4-6.5 C

Estimated density (#/hectare) by total length

Scientific Name	Total	0 dm	1 dm	2 dm	3 dm	4 dm	5 dm	≥ 5 dm
NON-SCHOOLING FISHES:								
<u>Sebastes zacentrus</u>	1488.3	---	5.2	463.1	1012.2	7.8	---	---
<u>Sebastes wilsoni</u>	1176.1	---	10.4	1139.6	26.0	---	---	---
<u>Lyopsetta exilis</u>	372.1	2.6	59.8	296.6	13.0	---	---	---
<u>Lycodes cortezianus</u>	158.7	2.6	7.8	135.3	13.0	---	---	---
<u>Sebastes elongatus</u>	93.7	---	13.0	36.4	36.4	7.8	---	---
<u>Microstomus pacificus</u>	72.9	---	---	31.2	26.0	15.6	---	---
unknown mottled poacher	57.2	---	10.4	46.8	---	---	---	---
<u>Sebastes helvomaculatus</u>	33.8	---	2.6	31.2	---	---	---	---
<u>Radulinus asprellus</u>	31.2	---	10.4	20.8	---	---	---	---
<u>Raja kincaidii</u>	20.8	---	13.0	5.2	---	---	2.6	---
<u>Glyptocephalus zachirus</u>	20.8	---	---	15.6	5.2	---	---	---
unknown mottled sculpin	18.2	---	2.6	13.0	2.6	---	---	---
<u>Anoplopoma fimbria</u>	13.0	---	---	---	---	---	---	13.0
<u>Icelinus filamentosus</u>	13.0	---	---	13.0	---	---	---	---
unknown flatfish	5.2	---	2.6	2.6	---	---	---	---
<u>Sebastes pinniger</u>	5.2	---	---	---	---	---	2.6	2.6
<u>Sebastes</u> sp. (juvenile)	5.2	5.2	---	---	---	---	---	---
<u>Eptatretus</u> sp.	2.6	---	---	---	---	2.6	---	---
<u>Raja binoculata</u>	2.6	---	---	---	---	---	---	2.6
<u>Sebastes babcocki</u>	2.6	---	2.6	---	---	---	---	---
<u>Sebastolobus alascanus</u>	2.6	---	---	---	2.6	---	---	---
<u>Hexagrammos decagrammus</u>	2.6	---	---	---	2.6	---	---	---
<u>Rathbunella</u> sp.	2.6	---	2.6	---	---	---	---	---
<u>Parophrys vetulus</u>	2.6	---	---	---	2.6	---	---	---

SCHOOLING FISHES:

<u>Sebastes wilsoni</u>	39.0	---	---	39.0	---	---	---	---
<u>Sebastes zacentrus</u>	39.0	---	---	---	39.0	---	---	---

ALL FISHES:

Total density: 3681.7

Diversity indices: Richness (S) = 22 Evenness (J) = 0.52 Diversity (H') = 1.60

INVERTEBRATES: (100.0 % of videotape usable)

	Estimated density (#/hectare)
<u>Ophiacantha</u> sp.	939.3
<u>Allocentrotus fragilis</u>	93.7
Pachastrellidae-like	52.0
<u>Florometra serrastissima</u>	18.2
<u>Henricia</u> sp.	15.6
<u>Ophiura sarsii</u>	15.6
Ophiurida	13.0
<u>Scypha/Iophon</u>	13.0
<u>Luidia foliolata</u>	10.4
<u>Archidoris odhneri</u>	7.8
pagurids	5.2
Cerianthid anemone	2.6
<u>Octopus dofleini</u>	2.6
<u>Octopus rubescens</u>	2.6
<u>Parastichopus</u> spp.	2.6
<u>Poraniopsis inflata</u>	2.6
<u>Pteraster</u> spp.	2.6
<u>Salpa fusiformis</u>	2.6
<u>Staurocalyptus</u> -like	2.6
<u>Stylasterias forreri</u>	2.6

Diversity indices: Richness (S) = 20 Evenness (J) = 0.34 Diversity (H') = 1.02

OTHER ORGANISMS PRESENT:

None

(Dive 88H2C continued)

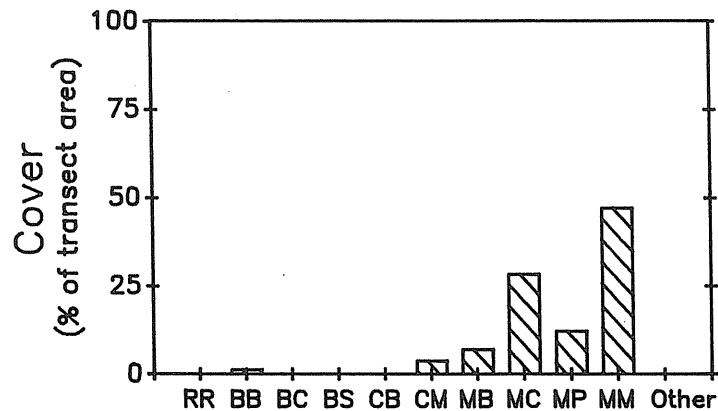
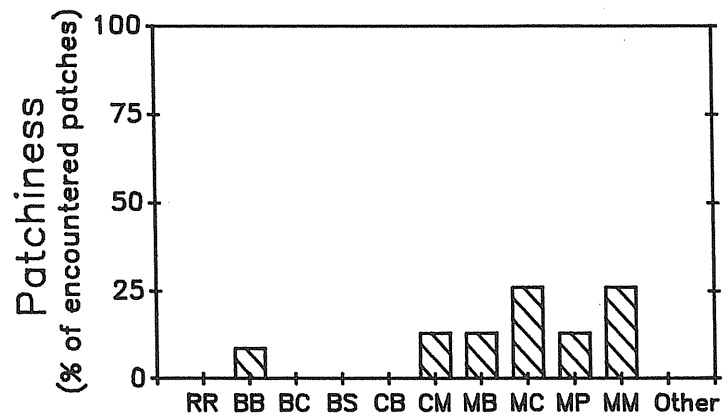
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
MM	Mud	47.1	26.1
MC	Mud + Cobble	28.4	26.1
MP	Mud + Pebble	12.2	13.0
MB	Mud + Boulder	7.0	13.0
CM	Cobble + Mud	3.9	13.0
BB	Boulder	1.3	8.7

Richness (S) = 6

Patchiness: Evenness (J) = 0.94 Diversity (H') = 1.30

Cover: Evenness (J) = 0.75 Diversity (H') = 1.34



Bottom type

Dive Code: 1988 Heceta Bank, Station 3, Dive A (88H3A)

Delta Dive: 1267

Date: 9/05/88

Time: 1149-1255

Minimum Depth: 240 ft (73 m)

Maximum Depth: 436 ft (133 m)

Remarks: End of transect temperature 6.8 C: 0.25 Knott current

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes wilsoni</u>	7780.1	131.4	7640.5	8.2	---	---	---	---
<u>Sebastes</u> sp. (juvenile)	4142.5	4115.9	26.7	---	---	---	---	---
<u>Sebastes proriger</u>	410.6	---	410.6	---	---	---	---	---
<u>Sebastes flavidus</u>	221.7	---	---	---	---	221.7	---	---
<u>Sebastes helvomaculatus</u>	137.5	2.1	98.5	37.0	---	---	---	---
unknown mottled poacher	65.7	---	61.6	4.1	---	---	---	---
<u>Sebastes elongatus</u>	32.8	---	14.4	18.5	---	---	---	---
<u>Sebastes pinniger</u>	30.8	---	---	---	---	28.7	2.1	---
unknown fish	28.7	28.7	---	---	---	---	---	---
unknown mottled sculpin	24.6	---	18.5	6.2	---	---	---	---
<u>Lycodes corteziianus</u>	22.6	---	22.6	---	---	---	---	---
<u>Microstomus pacificus</u>	16.4	---	---	4.1	8.2	4.1	---	---
<u>Sebastes ruberrimus</u>	8.2	---	---	---	---	4.1	4.1	---
<u>Sebastes zacentrus</u>	8.2	---	2.1	6.2	---	---	---	---
<u>Hexagrammos decagrammus</u>	8.2	---	2.1	---	6.2	---	---	---
<u>Raja rhina</u>	6.2	---	---	---	---	2.1	2.1	2.1
<u>Lyopsetta exilis</u>	4.1	---	4.1	---	---	---	---	---
<u>Sebastes chlorostictus</u>	2.1	---	---	---	---	2.1	---	---
<u>Sebastes nigrocinctus</u>	2.1	---	---	---	2.1	---	---	---
<u>Sebastes</u> sp. (large)	2.1	---	---	---	---	2.1	---	---
<u>Ophiodon elongatus</u>	2.1	---	---	---	---	---	2.1	---
<u>Glyptocephalus zachirus</u>	2.1	---	---	2.1	---	---	---	---

SCHOOLING FISHES:

<u>Sebastes wilsoni</u>	7603.6	24.6	7578.9	---	---	---	---	---
<u>Sebastes</u> sp. (juvenile)	4130.2	4105.6	24.6	---	---	---	---	---
<u>Sebastes proriger</u>	410.6	---	410.6	---	---	---	---	---
<u>Sebastes flavidus</u>	213.5	---	---	---	---	213.5	---	---
<u>Sebastes pinniger</u>	22.6	---	---	---	---	22.6	---	---

ALL FISHES:

Total density: 25339.7

Diversity indices: Richness (S) = 20

Evenness (J) = 0.18

Diversity (H') = 0.55

INVERTEBRATES: species present

Allocentrotus fragilis
Ceremaster patagonicus
Cystodytes lobatus
Florometra serratissima
Gorgonocephalus eucinemis
Henricia spp.
Hippasterias sp.
Lophaster/Asterias
Luidia foliolata
Ophiacantha sp.
Parastichopus californicus
Pteraster spp.
Pycnopodia helianthoides
Rathbunaster californicus
Solaster sp.
Stomphia spp.
Stylasterias forreri
Trididemnum sp.
unknown shelf sponge

OTHER ORGANISMS PRESENT:

unknown crustose red alga

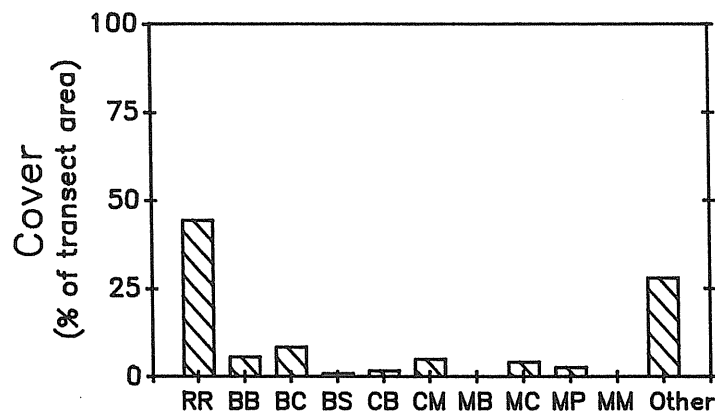
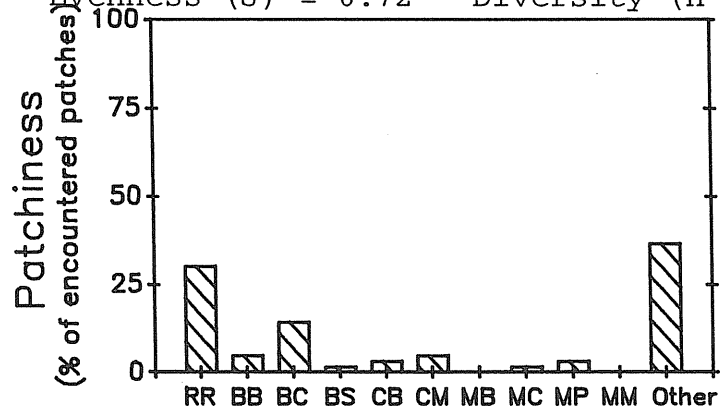
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
RR	Rock Ridge	44.2	30.2
CS	Cobble + Sand	9.5	7.9
BC	Boulder + Cobble	8.3	14.3
BB	Boulder	5.6	4.8
CM	Cobble + Mud	4.9	4.8
MC	Mud + Cobble	4.1	1.6
SP	Sand + Pebble	3.4	4.8
CP	Cobble + Pebble	3.3	3.2
MP	Mud + Pebble	2.6	3.2
BR	Boulder + Rocky Ridge	2.0	1.6
PM	Pebble + Mud	1.6	3.2
CC	Cobble	1.6	1.6
CB	Cobble + Boulder	1.6	3.2
CR	Cobble + Rock Ridge	1.5	1.6
BP	Boulder + Mud	1.1	1.6
PS	Pebble + Sand	1.1	3.2
SC	Sand + Cobble	1.0	4.8
PB	Pebble + Boulder	0.8	1.6
BM	Boulder + Mud	0.8	1.6
BS	Boulder + Sand	0.8	1.6

Richness (S) = 20

Patchiness: Evenness (J) = 0.83 Diversity (H') = 2.49

Cover: Evenness (J) = 0.72 Diversity (H') = 2.16



Bottom type

Dive Code: 1988 Heceta Bank, Station 3, Dive B (88H3B)

Delta Dive: 1268

Date: 9/05/88

Time: 1352-1501

Minimum Depth: 248 ft (76 m)

Maximum Depth: 450 ft (137)

Remarks: Temperature 7.2-6.8 C

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes wilsoni</u>	4032.5	---	3971.7	3.8	---	---	---	57.0
<u>Sebastes helvomaculatus</u>	188.0	---	22.8	148.2	17.1	---	---	---
<u>Sebastes</u> sp. (large)	108.3	98.8	9.5	---	---	---	---	---
<u>Paricelius hopliticus</u>	96.9	1.9	95.0	---	---	---	---	---
unknown mottled sculpin	49.4	13.3	34.2	1.9	---	---	---	---
<u>Sebastes elongatus</u>	47.5	---	17.1	24.7	5.7	---	---	---
<u>Rathbunella</u> sp.	17.1	1.9	15.2	---	---	---	---	---
<u>Hexagrammos decagrammus</u>	11.4	---	---	---	11.4	---	---	---
<u>Sebastes flavidus</u>	9.5	---	---	---	---	5.7	3.8	---
<u>Microstomus pacificus</u>	9.5	---	3.8	---	5.7	---	---	---
<u>Sebastes chlorostictus</u>	7.6	---	---	---	1.9	1.9	3.8	---
<u>Sebastes</u> sp. (juvenile)	5.7	---	1.9	3.8	---	---	---	---
<u>Ophiodon elongatus</u>	5.7	1.9	3.8	---	---	---	---	---
unknown fish	3.8	---	---	1.9	1.9	---	---	---
<u>Raja rhina</u>	3.8	---	---	---	---	---	---	3.8
<u>Sebastes pinniger</u>	3.8	---	---	---	---	3.8	---	---
unknown flatfish	1.9	1.9	---	---	---	---	---	---
<u>Raja binoculata</u>	1.9	---	---	---	---	---	---	1.9
<u>Sebastes nigrocinctus</u>	1.9	---	---	---	---	1.9	---	---
<u>Icelinus</u> sp. (?)	1.9	---	---	1.9	---	---	---	---
<u>Glyptocephalus zachirus</u>	1.9	---	---	1.9	---	---	---	---
<u>Psettichthys melanostictus</u>	1.9	---	---	---	1.9	---	---	---

SCHOOLING FISHES:

<u>Sebastes wilsoni</u>	4004.0	---	3947.0	---	---	---	---	57.0
<u>Sebastes</u> sp. (juvenile)	106.4	96.9	9.5	---	---	---	---	---
<u>Paricelius hopliticus</u>	1.9	---	1.9	---	---	---	---	---

ALL FISHES:

Total density: 8724.1

Diversity indices: Richness (S) = 19 Evenness (J) = 0.17 Diversity (H') = 0.51

INVERTEBRATES: (91.7 % of videotape usable)

	Estimated density (#/hectare)
<u>Scypha/Iophon</u>	25935.0
<u>Florometra serratissima</u>	22738.2
<u>Pachastrellidae-like</u>	4070.5
<u>Ophiacantha</u> sp.	2828.3
<u>Allocentrotus fragilis</u>	801.6
<u>Staurocalyptus-like</u>	341.9
<u>Parastichopus</u> spp.	197.5
<u>Henricia</u> sp.	186.1
<u>Pycnopodia/Rathbunaster</u>	66.5
<u>Mediaster aequalis</u>	57.0
<u>Luidia foliolata</u>	38.0
<u>Archidoris odhneri</u>	26.6
<u>Hippasterias</u> spp.	20.9
<u>Pteraster</u> spp.	20.9
<u>Gorgonocephalus eucinemis</u>	9.5
<u>Poraniopsis inflata</u>	7.6
<u>Stylasterias forreri</u>	5.7
<u>Crossaster papposus</u>	3.8
white fennistate sponge	3.8
<u>Octopus dofleini</u>	1.9

Diversity indices: Richness (S) = 20 Evenness (J) = 0.41 Diversity (H') = 1.22

OTHER ORGANISMS PRESENT:

Beggiotoa spp. (bacterial mat)
Encrusting Red Algae

(Dive 88H3B continued)

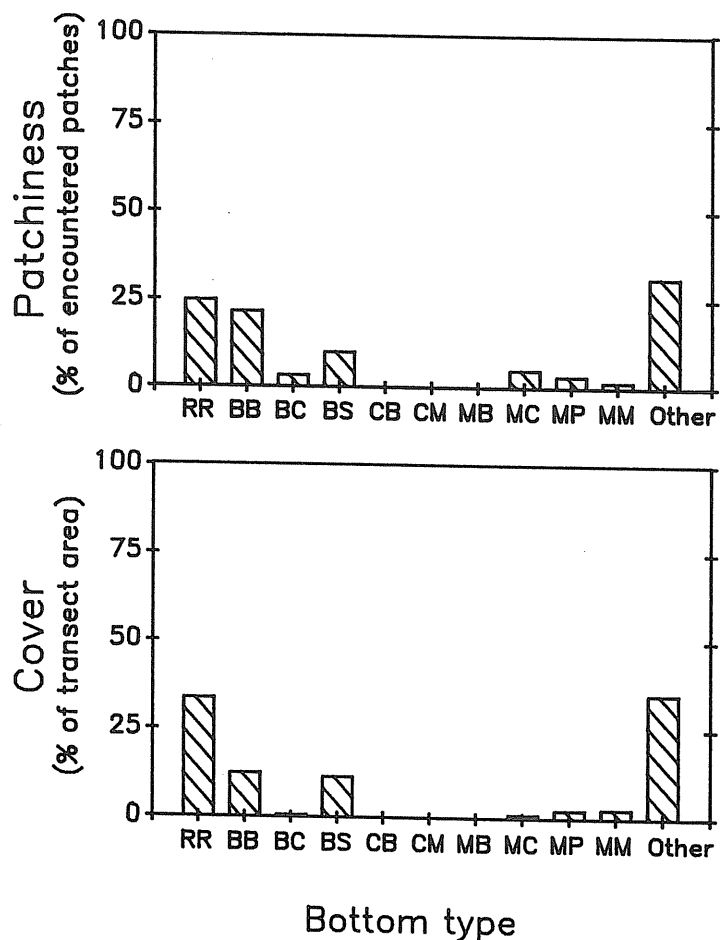
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
RR	Rock Ridge	33.7	24.6
BB	Boulder	12.5	21.3
BS	Boulder + Sand	11.5	9.8
PS	Pebble + Sand	10.7	6.6
BM	Boulder + Mud	6.3	6.6
SP	Sand + Pebble	3.7	3.3
SM	Sand + Mud	3.7	1.6
CS	Cobble + Sand	3.6	3.3
BP	Boulder + Mud	3.2	3.3
MM	Mud	2.9	1.6
MP	Mud + Pebble	2.5	3.3
SS	Sand	1.9	1.6
CP	Cobble + Pebble	1.5	1.6
MC	Mud + Cobble	1.2	4.9
BC	Boulder + Cobble	0.7	3.3
SC	Sand + Cobble	0.5	3.3

Richness (S) = 16

Patchiness: Evenness (J) = 0.85 Diversity (H') = 2.35

Cover: Evenness (J) = 0.80 Diversity (H') = 2.21



Dive Code: 1988 Heceta Bank, Station 3, Dive C (88H3C)

Delta Dive: 1269

Date: 9/05/88

Time: 1600-1709

Minimum Depth: 235 ft (72 m)

Maximum Depth: 452 ft (138 m)

Remarks: Temperature 7.2-6.8 C

Estimated density (#/hectare) by total length

Scientific Name	Total	0 dm	1 dm	2 dm	3 dm	4 dm	5 dm	≥ 5 dm
-----------------	-------	------	------	------	------	------	------	--------

NON-SCHOOLING FISHES:

<u>Sebastes</u> sp. (juvenile)	1957.5	1957.5	---	---	---	---	---	---
<u>Sebastes wilsoni</u>	330.4	---	112.1	218.4	---	---	---	---
<u>Radulinus asprellus</u>	214.5	---	210.6	3.9	---	---	---	---
<u>Sebastes helvomaculatus</u>	175.8	---	29.0	139.1	7.7	---	---	---
<u>Sebastes elongatus</u>	96.6	---	11.6	52.2	32.9	---	---	---
<u>Sebastes flavidus</u>	27.1	---	---	---	---	21.3	5.8	---
<u>Sebastes zacentrus</u>	21.3	---	7.7	7.7	5.8	---	---	---
<u>Lycodes corteziensis</u>	17.4	---	15.5	1.9	---	---	---	---
<u>Sebastes pinniger</u>	13.5	---	---	---	---	9.7	3.9	---
<u>Icelinus filamentosus</u>	13.5	---	---	13.5	---	---	---	---
<u>Microstomus pacificus</u>	11.6	---	1.9	3.9	5.8	---	---	---
<u>Lyopsetta exilis</u>	9.7	---	3.9	3.9	1.9	---	---	---
<u>Hexagrammos decagrammus</u>	7.7	---	---	---	5.8	1.9	---	---
<u>Sebastes chlorostictus</u>	5.8	---	---	---	---	5.8	---	---
<u>Ophiodon elongatus</u>	3.9	---	---	---	---	---	3.9	---
unknown mottled poacher	3.9	---	3.9	---	---	---	---	---
unknown small flatfish	1.9	1.9	---	---	---	---	---	---
unknown flatfish	1.9	---	---	---	1.9	---	---	---
<u>Eopsetta jordani</u>	1.9	---	---	---	1.9	---	---	---

SCHOOLING FISHES:

<u>Sebastes</u> sp. (juvenile)	1957.5	1957.5	---	---	---	---	---	---
<u>Sebastes wilsoni</u>	59.9	---	---	59.9	---	---	---	---

ALL FISHES:

Total density: 4933.3

Diversity indices: Richness (S) = 16 Evenness (J) = 0.65 Diversity (H') = 1.79

INVERTEBRATES: (88.5 % of videotape usable)

	Estimated density (#/hectare)
<u>Scypha/Iophon</u>	19743.0
<u>Florometra serratissima</u>	18973.9
<u>Ophiacantha</u> sp.	1630.9
<u>Allocentrotus fragilis</u>	817.4
<u>Parastichopus</u> spp.	216.4
<u>Henricia</u> sp.	125.6
<u>Pachastrellidae-like</u>	110.1
<u>Pteraster</u> spp.	50.2
<u>Luidia foliolata</u>	48.3
<u>Pycnopodia/Rathbunaster</u>	40.6
<u>Hippasterias</u> spp.	29.0
<u>Archidoris odhneri</u>	23.2
<u>Mediaster aequalis</u>	15.5
<u>Gorgonocephalus eucinemis</u>	9.7
<u>Staurocalyptus-like</u>	7.7
<u>Stomphia</u> sp.	5.8
<u>Octopus</u> sp.	3.9
<u>Poraniopsis inflata</u>	3.9
<u>Urticina piscivora</u>	3.9
<u>Cerianthid anemone</u>	1.9
<u>Cibrinopsis</u> sp.?	1.9
<u>Gephyreaster swifti</u>	1.9
<u>Swiftia</u> sp.	1.9
white fennistrate sponge	1.9

Diversity indices: Richness (S) = 24 Evenness (J) = 0.32 Diversity (H') = 1.02

OTHER ORGANISMS PRESENT:

Encrusting Red Algae

(Dive 88H3C continued)

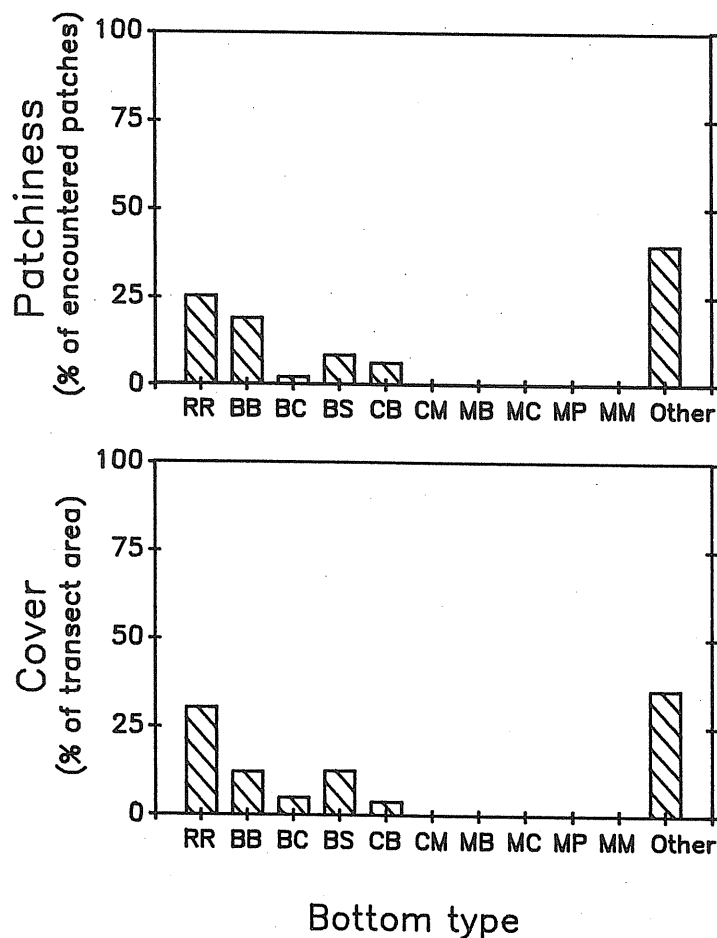
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
RR	Rock Ridge	30.4	25.0
SC	Sand + Cobble	15.9	16.7
BS	Boulder + Sand	12.6	8.3
SB	Sand + Boulder	12.3	14.6
BB	Boulder	12.3	18.8
BC	Boulder + Cobble	5.1	2.1
CC	Cobble	4.7	4.2
CB	Cobble + Boulder	4.0	6.3
SS	Sand	2.7	4.2

Richness (S) = 9

Patchiness: Evenness (J) = 0.90 Diversity (H') = 1.97

Cover: Evenness (J) = 0.89 Diversity (H') = 1.95



Dive Code: 1988 Heceta Bank, Station 4, Dive A (88H4A)

Delta Dive: 1276

Date: 9/12/88

Time: 0831-0939

Minimum Depth: 397 ft (121 m)

Maximum Depth: 425 ft (129 m)

Remarks: Visibility 15-20 feet; temperature throughout dive = 6.7 C

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes wilsoni</u>	2173.9	280.1	1893.8	---	---	---	---	---
<u>Sebastes flavidus</u>	272.9	---	---	---	12.0	261.0	---	---
<u>Sebastes helvomaculatus</u>	158.0	---	102.9	50.3	4.8	---	---	---
<u>Sebastes zacentrus</u>	91.0	---	50.3	40.7	---	---	---	---
<u>Sebastes elongatus</u>	59.9	2.4	16.8	33.5	7.2	---	---	---
unknown mottled sculpin	50.3	2.4	47.9	---	---	---	---	---
<u>Sebastes pinniger</u>	38.3	---	---	---	---	21.5	16.8	---
<u>Sebastes</u> sp. (juvenile)	38.3	35.9	2.4	---	---	---	---	---
unknown fish	14.4	9.6	4.8	---	---	---	---	---
<u>Lycodes corteziianus</u>	12.0	---	12.0	---	---	---	---	---
<u>Sebastes proriger</u>	12.0	---	---	7.2	4.8	---	---	---
unknown mottled poacher	9.6	---	9.6	---	---	---	---	---
<u>Sebastes ruberrimus</u>	7.2	---	---	---	---	2.4	4.8	---
<u>Lyopsetta exilis</u>	7.2	---	7.2	---	---	---	---	---
unknown small flatfish	4.8	---	4.8	---	---	---	---	---
<u>Raja rhina</u>	4.8	---	---	---	---	---	2.4	2.4
<u>Glyptocephalus zachirus</u>	4.8	---	2.4	2.4	---	---	---	---
unknown flatfish	2.4	---	---	---	---	2.4	---	---
<u>Hydrolagus colliei</u>	2.4	---	---	---	---	2.4	---	---
<u>Sebastes paucispinis</u>	2.4	---	---	---	---	---	2.4	---
<u>Eopsetta jordani</u>	2.4	---	---	---	2.4	---	---	---

SCHOOLING FISHES:

<u>Sebastes wilsoni</u>	646.4	129.3	517.1	---	---	---	---	---
<u>Sebastes flavidus</u>	196.3	---	---	---	---	196.3	---	---

ALL FISHES:

Total density: 3811.5

Diversity indices: Richness (S) = 17 Evenness (J) = 0.37 Diversity (H') = 1.04

INVERTEBRATES: species present

Allocentrotus fragilis

Ceremaster patagonicus

Corallimorphus (?)

Crossaster papposus

Cystodytes lobatus

Florometra serratissima

Henricia spp.

Hippasterias sp.

Lophaster/Asterias

Luidia foliolata

Ophiacantha sp.

Parastichopus spp.

Pteraster tessellatus

Pycnopodia helianthoides

Rathbunaster californicus

Solaster sp.

Stylasterias forreri

unknown finger sponge

unknown foliose sponge

unknown shelf sponge

unknown vase sponge

unknown white fenestrated sponge

Urticina piscivora

OTHER ORGANISMS PRESENT:

Beggiotoa spp. (bacterial mat)

(Dive 88H4A continued)

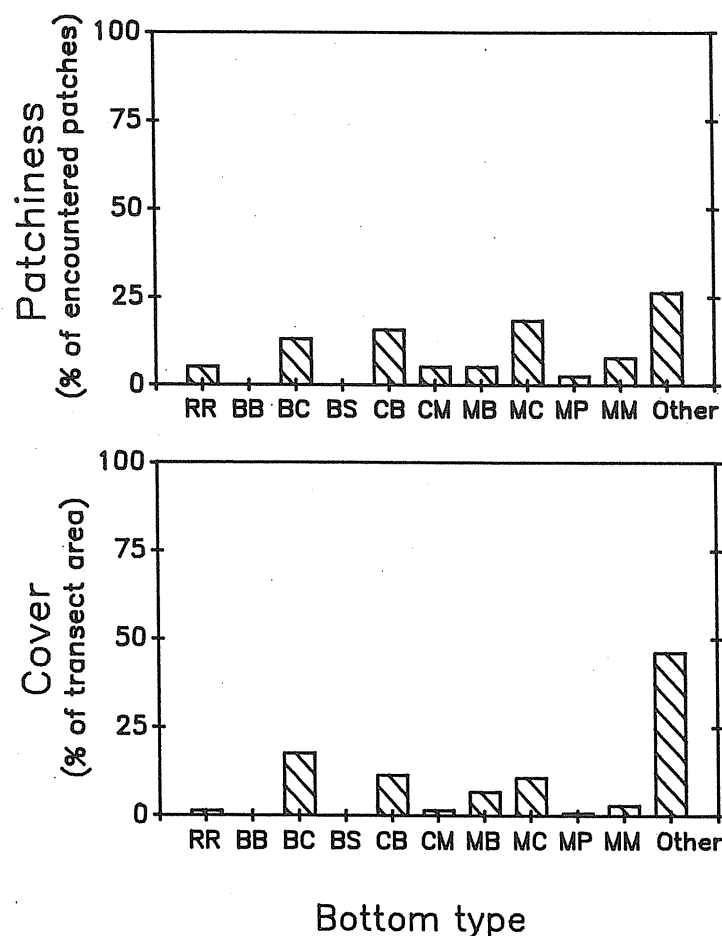
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
RC	Rock Ridge + Cobble	35.5	13.2
BC	Boulder + Cobble	17.7	13.2
CB	Cobble + Boulder	11.5	15.8
MC	Mud + Cobble	10.8	18.4
RB	Rock Ridge + Boulder	8.5	7.9
MB	Mud + Boulder	6.8	5.3
MM	Mud	3.0	7.9
FC	Flat Rock + Cobble	2.2	2.6
CM	Cobble + Mud	1.7	5.3
RR	Rock Ridge	1.5	5.3
MP	Mud + Pebble	0.8	2.6
SC	Sand + Cobble	0.0	2.6

Richness (S) = 12

Patchiness: Evenness (J) = 0.92 Diversity (H') = 2.29

Cover: Evenness (J) = 0.80 Diversity (H') = 1.92



Dive Code: 1988 Heceta Bank, Station 4, Dive B (88H4B)

Delta Dive: 1277

Date: 9/12/88

Time: 1047-1159

Minimum Depth: 385 ft (117 m)

Maximum Depth: 415 ft (126 m)

Remarks: Temperature throughout dive = 6.8 C

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes wilsoni</u>	2477.8	2.1	1757.0	710.1	8.5	---	---	---
<u>Sebastes flavidus</u>	339.0	---	---	---	---	339.0	---	---
<u>Sebastes helvomaculatus</u>	264.4	---	78.9	181.2	4.3	---	---	---
<u>Sebastes zacentrus</u>	232.4	---	49.0	183.4	---	---	---	---
<u>Radulinus asprellus</u>	172.7	10.7	147.1	14.9	---	---	---	---
<u>Sebastes elongatus</u>	81.0	---	29.9	32.0	19.2	---	---	---
<u>Microstomus pacificus</u>	44.8	---	14.9	21.3	8.5	---	---	---
<u>Rathbunella sp.</u>	38.4	2.1	34.1	2.1	---	---	---	---
<u>Sebastes pinniger</u>	36.2	---	---	---	2.1	29.9	4.3	---
<u>Sebastes sp. (juvenile)</u>	21.3	21.3	---	---	---	---	---	---
<u>Sebastes ruberrimus</u>	19.2	---	---	---	2.1	14.9	2.1	---
<u>Lyopsetta exilis</u>	14.9	---	12.8	2.1	---	---	---	---
unknown small flatfish	10.7	2.1	8.5	---	---	---	---	---
<u>Raja rhina</u>	10.7	---	---	---	---	4.3	6.4	---
<u>Hydrolagus colliei</u>	4.3	---	---	---	---	4.3	---	---
<u>Raja binoculata</u>	4.3	---	---	---	---	---	4.3	---
<u>Sebastes proriger</u>	4.3	---	---	2.1	2.1	---	---	---
<u>Sebastes nigrocinctus</u>	2.1	---	---	---	---	2.1	---	---
<u>Ophiodon elongatus</u>	2.1	---	---	---	---	---	---	2.1
<u>Icelinus filamentosus</u>	2.1	---	---	2.1	---	---	---	---
<u>Eopsetta jordani</u>	2.1	---	---	---	2.1	---	---	---

SCHOOLING FISHES:

<u>Sebastes wilsoni</u>	1236.8	---	1236.8	---	---	---	---	---
<u>Sebastes flavidus</u>	290.0	---	---	---	---	290.0	---	---
<u>Sebastes helvomaculatus</u>	2.1	---	---	2.1	---	---	---	---

ALL FISHES:

Total density: 5313.8

Diversity indices: Richness (S) = 19 Evenness (J) = 0.43 Diversity (H') = 1.28

INVERTEBRATES: (80.0 % of videotape usable)

	Estimated density (#/hectare)
<u>Ophiacantha</u> sp.	12395.2
<u>Florometra serratissima</u>	7535.7
<u>Scypha/Iophon</u>	7021.8
<u>Allocentrotus fragilis</u>	857.2
Pachastrellidae-like	102.4
<u>Parastichopus</u> spp.	102.4
white fennistrate sponge	81.0
<u>Henricia</u> sp.	21.3
<u>Pycnopodia/Rathbunaster</u>	17.1
<u>Archidoris odhneri</u>	14.9
<u>Gephyreaster swifti</u>	12.8
<u>Luidia foliolata</u>	12.8
<u>Hippasterias</u> spp.	8.5
<u>Mediaster aequalis</u>	6.4
<u>Gorgonocephalus eucinemis</u>	4.3
<u>Octopus dofleini</u>	4.3
<u>Stylasterias forreri</u>	4.3
<u>Ophiura sarsii</u>	2.1
<u>Stomphia coccinea</u>	2.1
<u>Urticina piscivora</u>	2.1

Diversity indices: Richness (S) = 20 Evenness (J) = 0.42 Diversity (H') = 1.26

OTHER ORGANISMS PRESENT:

None

(Dive 88H4B continued)

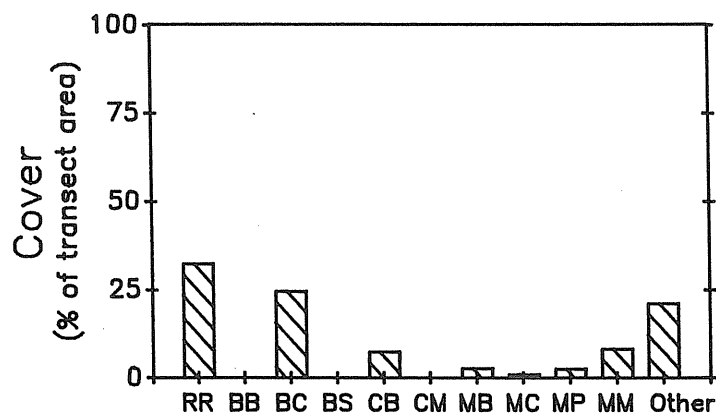
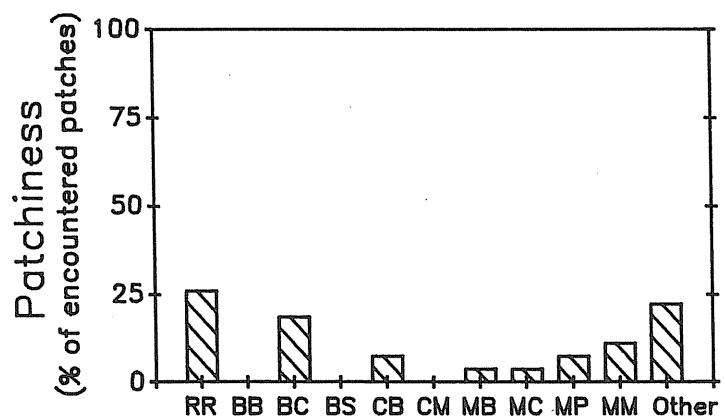
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
RR	Rock Ridge	32.3	25.9
BC	Boulder + Cobble	24.6	18.5
BR	Boulder + Rocky Ridge	12.4	5.6
MM	Mud	8.2	11.1
CB	Cobble + Boulder	7.4	7.4
CP	Cobble + Pebble	6.0	9.3
MB	Mud + Boulder	2.7	3.7
MP	Mud + Pebble	2.6	7.4
CC	Cobble	1.4	3.7
RB	Rock Ridge + Boulder	1.2	1.9
MC	Mud + Cobble	1.0	3.7
BM	Boulder + Mud	0.2	1.9

Richness (S) = 12

Patchiness: Evenness (J) = 0.92 Diversity (H') = 2.29

Cover: Evenness (J) = 0.76 Diversity (H') = 1.90



Bottom type

Dive Code: 1988 Heceta Bank, Station 4, Dive C (88H4C)

Delta Dive: 1278

Date: 9/12/88

Time: 1332-1449

Minimum Depth: 400 ft (122 m)

Maximum Depth: 430 ft (131 m)

Remarks: Mid-transect temperature = 6.8 C

Estimated density (#/hectare) by total length

Scientific Name	Total	0 dm	1 dm	2 dm	3 dm	4 dm	5 dm	≥ 5 dm
NON-SCHOOLING FISHES:								
<u>Sebastes wilsoni</u>	3471.4	68.2	1083.2	2309.3	10.7	---	---	---
<u>Sebastes flavidus</u>	390.2	---	---	---	4.3	298.5	87.4	---
<u>Sebastes zacentrus</u>	249.5	---	29.9	206.8	12.8	---	---	---
<u>Sebastes pinnigert</u>	177.0	21.3	---	---	2.1	89.6	64.0	---
<u>Sebastes helvomaculatus</u>	170.6	---	36.2	115.1	19.2	---	---	---
<u>Sebastes</u> sp. (large)	72.5	12.8	10.7	38.4	6.4	4.3	---	---
<u>Sebastes elongatus</u>	70.4	---	8.5	38.4	23.5	---	---	---
<u>Sebastes proriger</u>	59.7	---	---	32.0	27.7	---	---	---
unknown mottled sculpin	46.9	10.7	36.2	---	---	---	---	---
<u>Sebastes auriculatus</u>	42.6	---	---	---	42.6	---	---	---
<u>Sebastes</u> sp. (juvenile)	17.1	17.1	---	---	---	---	---	---
<u>Microstomus pacificus</u>	14.9	---	---	8.5	6.4	---	---	---
<u>Paricelius hopliticus</u>	12.8	---	12.8	---	---	---	---	---
<u>Raja rhina</u>	10.7	---	2.1	---	2.1	---	---	6.4
<u>Rathbunella</u> sp.	6.4	---	6.4	---	---	---	---	---
<u>Hydrolagus colliei</u>	4.3	---	---	---	4.3	---	---	---
<u>Sebastes paucispinis</u>	4.3	---	---	---	---	4.3	---	---
<u>Icelinus</u> sp. (?)	4.3	---	---	2.1	2.1	---	---	---
<u>Glyptocephalus zachirus</u>	4.3	---	2.1	---	2.1	---	---	---
<u>Lyopsetta exilis</u>	4.3	---	2.1	2.1	---	---	---	---
unknown fish	2.1	---	2.1	---	---	---	---	---
unknown flatfish	2.1	---	---	---	---	---	2.1	---
<u>Icelinus filamentosus</u>	2.1	---	---	2.1	---	---	---	---
unknown mottled poacher	2.1	---	2.1	---	---	---	---	---
<u>Parophrys vetulus</u>	2.1	---	---	---	2.1	---	---	---

SCHOOLING FISHES:

<u>Sebastes wilsoni</u>	865.7	42.6	236.7	586.4	---	---	---	---
<u>Sebastes flavidus</u>	324.1	---	---	---	---	238.8	85.3	---
<u>Sebastes pinniger</u>	142.9	21.3	---	---	---	68.2	53.3	---
<u>Sebastes auriculatus</u>	42.6	---	---	---	42.6	---	---	---
<u>Sebastes proriger</u>	32.0	---	---	32.0	---	---	---	---

ALL FISHES:

Total density: 6252.0

Diversity indices: Richness (S) = 22 Evenness (J) = 0.39 Diversity (H') = 1.19

INVERTEBRATES: (91.8 % of videotape usable)

	Estimated density (#/hectare)
<u>Scypha/Iophon</u>	16764.4
<u>Florometra serratissima</u>	15817.6
<u>Ophiacantha</u> sp.	13233.3
<u>Allocentrotus fragilis</u>	1552.3
<u>Staurocalyptus</u> -like	127.9
<u>Parastichopus</u> spp.	123.7
<u>Pachastrellidae</u> -like	89.6
<u>Aphrocallistes</u> -like	68.2
<u>Archidoris odhneri</u>	66.1
<u>Henricia</u> sp.	51.2
<u>Luidia foliolata</u>	29.9
<u>Pycnopodia/Rathbunaster</u>	19.2
<u>Hippasterias</u> spp.	17.1
<u>Pteraster</u> spp.	17.1
<u>Mediaster aequalis</u>	14.9
<u>Swiftia</u> sp.	8.5
<u>Ophiura sarsii</u>	6.4
<u>Stylasterias forreri</u>	6.4
<u>Lophaster/Asterias</u>	4.3
<u>Gorgonocephalus eucinemis</u>	2.1
<u>Lopholithodes foraminatus</u>	2.1
<u>Orthasterias koehleri</u>	2.1
<u>Foraniopsis inflata</u>	2.1
white fennistrate sponge	2.1

Diversity indices: Richness (S) = 24 Evenness (J) = 0.41 Diversity (H') = 1.29

OTHER ORGANISMS PRESENT:

Beggiotoa spp. (bacterial mat)

(Dive 88H4C continued)

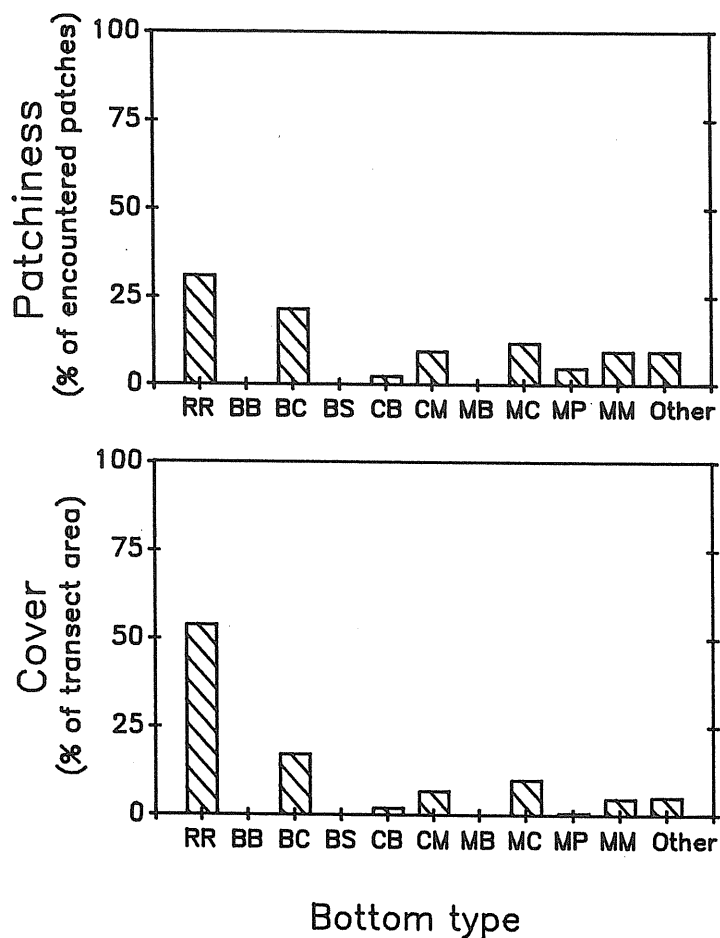
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
RR	Rock Ridge	53.8	31.0
BC	Boulder + Cobble	17.1	21.4
MC	Mud + Cobble	9.8	11.9
CM	Cobble + Mud	6.8	9.5
MM	Mud	4.7	9.5
RB	Rock Ridge + Boulder	2.2	4.8
CC	Cobble	2.2	2.4
CB	Cobble + Boulder	2.0	2.4
BM	Boulder + Mud	0.8	2.4
MP	Mud + Pebble	0.7	4.8

Richness (S) = 10

Patchiness: Evenness (J) = 0.85 Diversity (H') = 1.95

Cover: Evenness (J) = 0.65 Diversity (H') = 1.51



Dive Code: 1988 Heceta Bank, Station 5, Dive A (88H5A)

Delta Dive: 1271

Date: 9/06/88

Time: 1045-1255

Minimum Depth: 980 ft (299 m)

Maximum Depth: 1030 ft (314 m)

Remarks: Temperature 5.7-6.2 C

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Microstomus pacificus</u>	110.1	---	1.9	40.6	61.8	5.8	---	---
<u>Lycodes corteziianus</u>	106.3	---	34.8	48.3	23.2	---	---	---
<u>Sebastolobus alascanus</u>	102.4	---	63.8	38.6	---	---	---	---
unknown mottled poacher	48.3	---	3.9	44.4	---	---	---	---
<u>Glyptocephalus zachirus</u>	36.7	---	1.9	27.1	7.7	---	---	---
<u>Lyopsetta exilis</u>	32.9	---	3.9	25.1	3.9	---	---	---
<u>Anoplopoma fimbria</u>	29.0	---	---	---	---	25.1	3.9	---
<u>Hydrolagus colliei</u>	15.5	---	---	---	---	7.7	7.7	---
unknown small flatfish	11.6	11.6	---	---	---	---	---	---
<u>Sebastes babcocki</u>	7.7	---	---	5.8	1.9	---	---	---
<u>Bathylagus ochotensis</u>	5.8	---	5.8	---	---	---	---	---
<u>Sebastes diploproa</u>	5.8	---	---	1.9	3.9	---	---	---
<u>Raja binoculata</u>	1.9	---	---	---	---	1.9	---	---
<u>Sebastes helvomaculatus</u>	1.9	---	---	1.9	---	---	---	---
<u>Careproctus melanurus</u>	1.9	---	---	1.9	---	---	---	---
<u>Atheresthes stomias</u>	1.9	---	---	---	---	1.9	---	---

SCHOOLING FISHES:

None

ALL FISHES:

Total density: 519.8

Diversity indices: Richness (S) = 15

Evenness (J) = 0.76

INVERTEBRATES: species present

Allocentrotus fragilis

Gephyreaster swifti

Luidia foliolata

Mediaster aequalis

Neptunea sp.

Octopus spp.

Pagurus spp.

Parastichopus spp.

Pycnopodia helianthoides

Rathbunaster californicus

(Dive 88H5A continued)

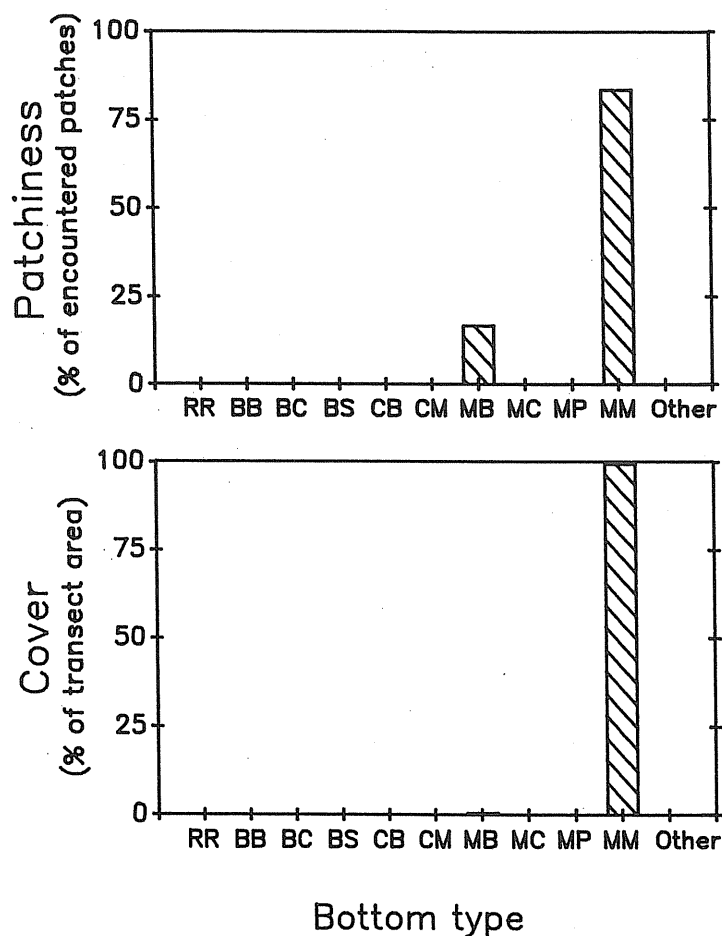
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
MM	Mud	99.5	83.3
MB	Mud + Boulder	0.5	16.7

Richness (S) = 2

Patchiness: Evenness (J) = 0.65 Diversity (H') = 0.45

Cover: Evenness (J) = 0.05 Diversity (H') = 0.03



Dive Code: 1988 Heceta Bank, Station 5, Dive B (88H5B)

Delta Dive: 1272

Date: 9/06/88

Time: 1311-1425

Minimum Depth: 940 ft (286 m)

Maximum Depth: 1025 ft (312 m)

Remarks: Temperature 5.9-6.2 C

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Microstomus pacificus</u>	64.1	---	1.6	16.4	29.6	13.2	3.3	---
<u>Lycodes corteziianus</u>	47.7	---	1.6	13.2	31.2	1.6	---	---
unknown mottled poacher	44.4	---	---	42.7	1.6	---	---	---
<u>Sebastolobus alascanus</u>	41.1	---	6.6	27.9	6.6	---	---	---
<u>Glyptocephalus zachirus</u>	34.5	---	---	14.8	18.1	1.6	---	---
<u>Lycodes diapterus</u>	21.4	---	1.6	11.5	8.2	---	---	---
<u>Anoplopoma fimbria</u>	11.5	---	---	---	---	4.9	6.6	---
<u>Careproctus melanurus</u>	11.5	---	---	6.6	4.9	---	---	---
<u>Hydrolagus colliei</u>	9.9	---	---	---	3.3	6.6	---	---
unknown fish	8.2	1.6	4.9	---	1.6	---	---	---
unknown small flatfish	6.6	3.3	1.6	1.6	---	---	---	---
<u>Sebastes diploproa</u>	4.9	---	---	1.6	3.3	---	---	---
<u>Lyopsetta exilis</u>	4.9	---	---	4.9	---	---	---	---
<u>Raja binoculata</u>	3.3	---	---	---	---	---	---	3.3
<u>Raja kincaidii</u>	3.3	---	---	1.6	---	1.6	---	---
unknown flatfish	1.6	---	1.6	---	---	---	---	---
<u>Eptatretus</u> sp.	1.6	---	---	---	1.6	---	---	---
<u>Raja</u> sp.	1.6	---	1.6	---	---	---	---	---
<u>Lycodapus</u> sp.	1.6	---	1.6	---	---	---	---	---
unknown eelpout	1.6	---	---	---	1.6	---	---	---
<u>Sebastes babcocki</u>	1.6	---	---	---	1.6	---	---	---
<u>Sebastes</u> sp. (large)	1.6	---	---	---	1.6	---	---	---
<u>Eopsetta jordani</u>	1.6	---	---	---	1.6	---	---	---

SCHOOLING FISHES:

<u>Lycodes corteziianus</u>	1.6	---	---	1.6	---	---	---	---
<u>Microstomus pacificus</u>	1.6	---	---	---	1.6	---	---	---

ALL FISHES:

Total density: 333.69

Diversity indices: Richness (S) = 20 Evenness (J) = 0.77 Diversity (H') = 2.30

INVERTEBRATES: (73.5 % of videotape usable)

	Estimated density (#/hectare)
<u>Allocentrotus fragilis</u>	1158.9
<u>Parastichopus</u> spp.	376.4
pagurids	295.9
<u>Pycnopodia/Rathbunaster</u>	182.5
Neptuneidae	118.4
<u>Mediaster aequalis</u>	29.6
<u>Florometra serratissima</u>	19.7
<u>Octopus rubescens</u>	18.1
<u>Scypha/Iophon</u>	16.4
<u>Luidia foliolata</u>	13.2
<u>Lophogorgia</u> -like	6.6
<u>Henricia</u> sp.	4.9
Pachastrellidae-like	1.6

Diversity indices: Richness (S) = 13 Evenness (J) = 0.59 Diversity (H') = 1.51

OTHER ORGANISMS PRESENT:

None

(Dive 88H5B continued)

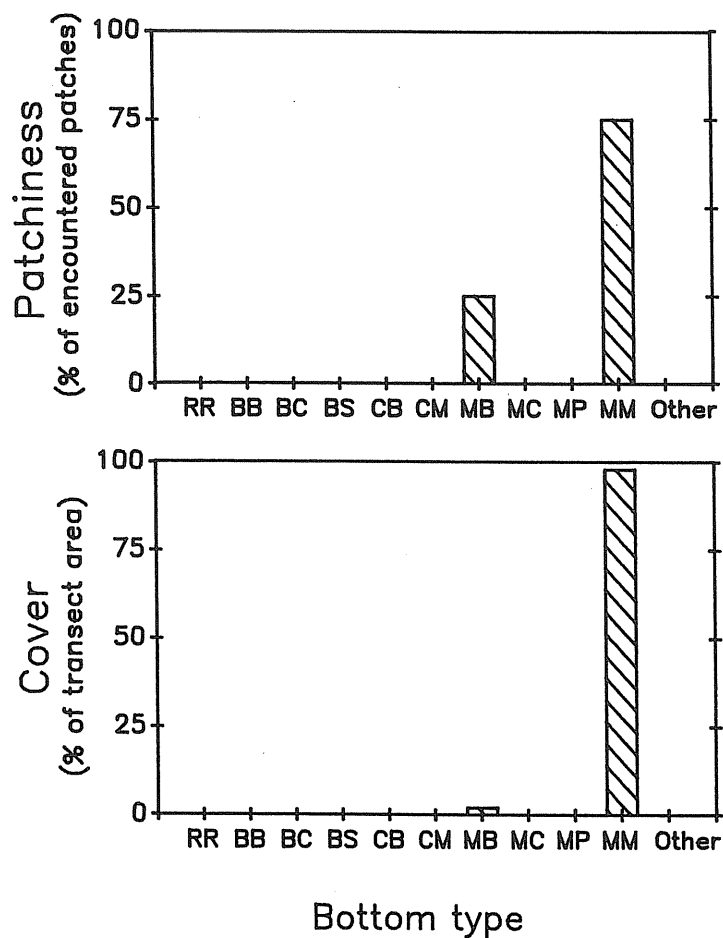
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
MM	Mud	97.9	75.0
MB	Mud + Boulder	2.1	25.0

Richness (S) = 2

Patchiness: Evenness (J) = 0.81 Diversity (H') = 0.56

Cover: Evenness (J) = 0.15 Diversity (H') = 0.10



Dive Code: 1988 Heceta Bank, Station 5, Dive C (88H5C)

Delta Dive: 1273

Date: 9/06/88

Time: 1549-1700

Minimum Depth: 915 ft (279 m)

Maximum Depth: 1060 ft (323 m)

Remarks: None

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastolobus alascanus</u>	81.5	2.3	27.9	37.2	11.6	2.3	---	---
<u>Microstomus pacificus</u>	81.5	---	2.3	16.3	39.6	16.3	7.0	---
<u>Lycodes cortezianus</u>	62.8	---	4.7	46.6	11.6	---	---	---
unknown mottled poacher	53.5	4.7	2.3	46.6	---	---	---	---
<u>Glyptocephalus zachirus</u>	27.9	7.0	2.3	9.3	9.3	---	---	---
<u>Hydrolagus colliei</u>	14.0	---	---	---	---	14.0	---	---
unknown fish	11.6	7.0	4.7	---	---	---	---	---
unknown small flatfish	7.0	7.0	---	---	---	---	---	---
<u>Careproctus melanurus</u>	7.0	---	---	2.3	4.7	---	---	---
<u>Raja rhina</u>	4.7	---	---	---	---	2.3	---	2.3
<u>Anoplopoma fimbria</u>	4.7	---	---	---	---	2.3	---	2.3
<u>Lyopsetta exilis</u>	4.7	2.3	---	2.3	---	---	---	---
<u>Eptatretus</u> sp.	2.3	2.3	---	---	---	---	---	---
<u>Raja kincaidii</u>	2.3	---	---	---	---	2.3	---	---
<u>Sebastes babcocki</u>	2.3	---	---	2.3	---	---	---	---
<u>Sebastes diploproa</u>	2.3	---	---	2.3	---	---	---	---
<u>Sebastes</u> sp. (large)	2.3	---	---	---	2.3	---	---	---

SCHOOLING FISHES:

unknown mottled poacher	2.3	---	---	2.3	---	---	---	---
-------------------------	-----	-----	-----	-----	-----	-----	-----	-----

ALL FISHES:

Total density:	374.7
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Diversity indices:	Richness (S) = 14	Evenness (J) = 0.72	Diversity (H') = 1.91
--------------------	-------------------	---------------------	-----------------------

INVERTEBRATES: (100.0 % of videotape usable)

	Estimated density (#/hectare)
<u>Allocentrotus fragilis</u>	1010.1
<u>Parastichopus</u> spp.	360.8
<u>Pycnopodia/Rathbunaster</u>	135.0
pagurids	132.7
<u>Mediaster aequalis</u>	44.2
<u>Octopus rubescens</u>	27.9
<u>Luidia foliolata</u>	23.3
<u>Florometra serratissima</u>	4.7
Neogastropoda	4.7
<u>Stylasterias forreri</u>	4.7
Trophoninae	4.7
<u>Brissaster</u> sp.	2.3
<u>Henricia</u> sp.	2.3
<u>Pteraster</u> spp.	2.3
<u>Rossia pacifica</u>	2.3

Diversity indices:

Richness (S) = 15

Evenness (J) = 0.50

Diversity (H') = 1.35

OTHER ORGANISMS PRESENT:

None

(Dive 88H5C continued)

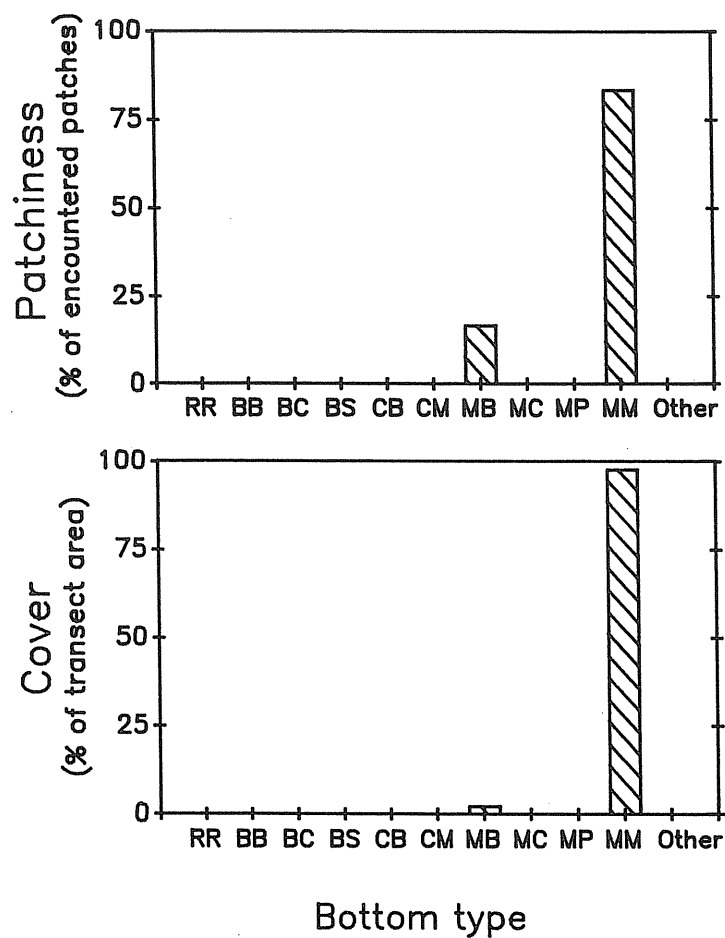
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
MM	Mud	97.7	83.3
MB	Mud + Boulder	2.3	16.7

Richness (S) = 2

Patchiness: Evenness (J) = 0.65 Diversity (H') = 0.45

Cover: Evenness (J) = 0.16 Diversity (H') = 0.11



Dive Code: 1988 Heceta Bank, Station 6, Dive A (88H6A)

Delta Dive: 1274

Date: 9/07/88

Time: 1155-1304

Minimum Depth: 460 ft (140 m)

Maximum Depth: 1200 ft (366 m)

Remarks: Temperature 6.4-6.6 C

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes zacentrus</u>	1222.6	---	250.6	790.3	181.7	---	---	---
<u>Sebastes wilsoni</u>	344.2	---	165.2	179.0	---	---	---	---
<u>Sebastes helvomaculatus</u>	143.2	---	77.1	63.3	2.8	---	---	---
<u>Sebastolobus alascanus</u>	143.2	5.5	52.3	52.3	27.5	5.5	---	---
<u>Microstomus pacificus</u>	99.1	---	22.0	41.3	24.8	8.3	2.8	---
unknown mottled poacher	82.6	---	5.5	77.1	---	---	---	---
<u>Lycodes corteziianus</u>	33.0	---	---	5.5	19.3	8.3	---	---
<u>Sebastes elongatus</u>	27.5	---	2.8	19.3	5.5	---	---	---
<u>Sebastes</u> sp. (large)	22.0	---	2.8	19.3	---	---	---	---
<u>Hydrolagus colliei</u>	11.0	---	---	---	8.3	2.8	---	---
<u>Sebastes diploproa</u>	11.0	---	2.8	---	2.8	5.5	---	---
unknown flatfish	8.3	---	---	2.8	2.8	---	2.8	---
<u>Sebastes babcocki</u>	8.3	---	---	2.8	2.8	---	2.8	---
<u>Ophiodon elongatus</u>	8.3	---	---	---	---	---	---	8.3
unknown mottled sculpin	8.3	---	---	8.3	---	---	---	---
<u>Sebastes</u> sp. (blotched)	5.5	---	---	5.5	---	---	---	---
<u>Careproctus melanurus</u>	5.5	---	---	---	5.5	---	---	---
<u>Glyptocephalus zachirus</u>	5.5	---	---	2.8	2.8	---	---	---
<u>Eptatretus</u> sp.	2.8	---	---	---	2.8	---	---	---
unknown blacksmelt	2.8	---	2.8	---	---	---	---	---
<u>Lycodapus</u> sp.	2.8	---	2.8	---	---	---	---	---
<u>Sebastes brevispinis</u>	2.8	---	---	---	---	---	2.8	---
<u>Sebastes nigrocinctus</u>	2.8	---	---	---	2.8	---	---	---
<u>Sebastes pinniger</u>	2.8	---	---	---	---	2.8	---	---
<u>Sebastes proriger</u>	2.8	---	---	2.8	---	---	---	---
<u>Sebastes ruberrimus</u>	2.8	---	---	---	---	2.8	---	---
<u>Sebastes</u> sp. (juvenile)	2.8	---	2.8	---	---	---	---	---
<u>Anoplopoma fimbria</u>	2.8	---	---	---	---	---	2.8	---
<u>Icelinus</u> sp. (?)	2.8	---	---	2.8	---	---	---	---
<u>Radulinus asprellus</u>	2.8	---	2.8	---	---	---	---	---
<u>Eopsetta jordani</u>	2.8	---	---	---	2.8	---	---	---

SCHOOLING FISHES:

<u>Sebastes zacentrus</u>	27.5	---	---	---	27.5	---	---	---
<u>Sebastes wilsoni</u>	2.8	---	2.8	---	---	---	---	---
<u>Sebastolobus alascanus</u>	2.8	2.8	---	---	---	---	---	---

ALL FISHES:

Total density: 2257.9

Diversity indices: Richness (S) = 29 Evenness (J) = 0.49 Diversity (H') = 1.64

INVERTEBRATES: (99.9 % of videotape usable)

	Estimated density (#/hectare)
<u>Allocentrotus fragilis</u>	14359.7
Pachastrellidae-like	1922.0
<u>Scypha/Iophon</u>	773.7
<u>Parastichopus</u> spp.	749.0
<u>Pycnopodia/Rathbunaster</u>	369.0
<u>Ophiacantha</u> sp.	168.0
white fennistrate sponge	90.9
<u>Rossia pacifica</u>	57.8
<u>Mediaster aequalis</u>	33.0
<u>Pandalus</u> sp.	30.3
<u>Luidia foliolata</u>	24.8
Cerianthid anemone	19.3
galathidid	13.8
<u>Florometra serrastissima</u>	11.0
<u>Lophogorgia</u> -like	11.0
<u>Swiftia</u> sp.	11.0
<u>Aphrocallistes</u> -like	5.5
<u>Henricia</u> sp.	5.5
<u>Octopus rubescens</u>	5.5
<u>Opisthoteuthis californica</u>	5.5
<u>Salpa fusiformis</u>	5.5
<u>Stomphia</u> sp.	5.5
<u>Antiplanes</u> sp.	2.8

Diversity indices: Richness (S) = 23 Evenness (J) = 0.30 Diversity (H') = 0.93

OTHER ORGANISMS PRESENT:

None

(Dive 88H6A continued)

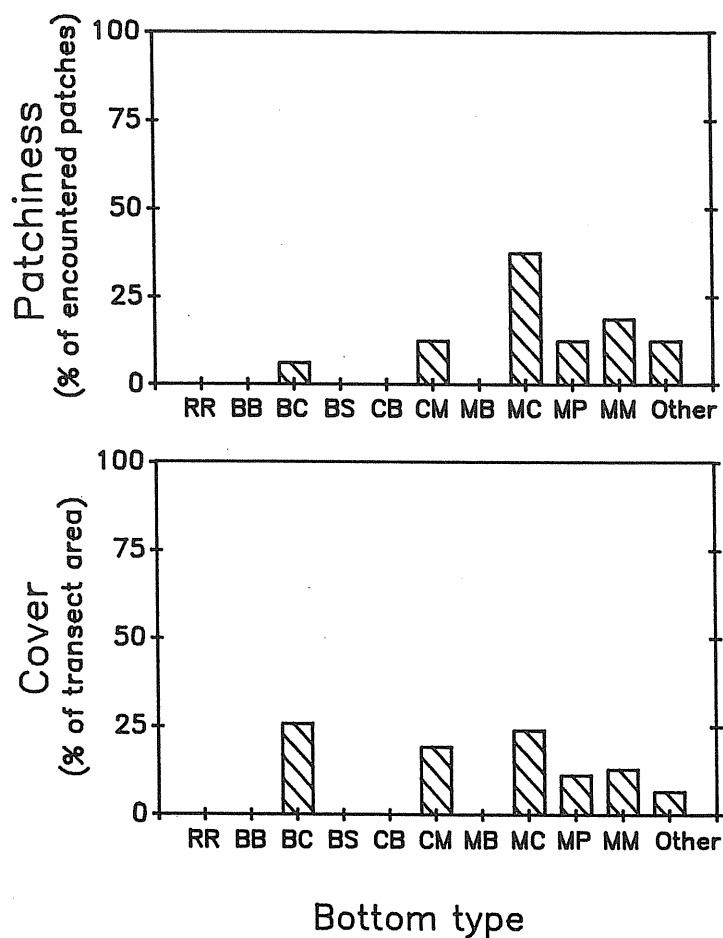
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
BC	Boulder + Cobble	25.8	6.3
MC	Mud + Cobble	24.0	37.5
CM	Cobble + Mud	19.3	12.5
MM	Mud	13.0	18.8
MP	Mud + Pebble	11.3	12.5
MF	Mud + Flat Rock	6.7	12.5

Richness (S) = 6

Patchiness: Evenness (J) = 0.91 Diversity (H') = 1.63

Cover: Evenness (J) = 0.94 Diversity (H') = 1.70



Dive Code: 1988 Heceta Bank, Station 6, Dive B (88H6B)

Delta Dive: 1275

Date: 9/07/88

Time: 1414-1539

Minimum Depth: 460 ft (140 m)

Maximum Depth: 1200 ft (366 m)

Remarks: Temperature 5.8-6.5 C

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes wilsoni</u>	1138.4	---	19.6	1106.5	12.2	---	---	---
<u>Sebastes zacentrus</u>	749.1	---	39.2	668.3	41.6	---	---	---
<u>Sebastolobus alascanus</u>	166.5	9.8	90.6	58.8	7.3	---	---	---
<u>Sebastes helvomaculatus</u>	115.1	---	44.1	63.7	7.3	---	---	---
<u>Microstomus pacificus</u>	100.4	4.9	7.3	41.6	44.1	2.4	---	---
unknown mottled poacher	85.7	---	4.9	80.8	---	---	---	---
<u>Lycodes corteziianus</u>	36.7	---	---	19.6	17.1	---	---	---
<u>Hydrolagus colliei</u>	26.9	---	---	2.4	---	17.1	7.3	---
<u>Bathylagus ochotensis</u>	19.6	---	19.6	---	---	---	---	---
<u>Sebastes elongatus</u>	14.7	---	---	14.7	---	---	---	---
<u>Icelinus filamentosus</u>	12.2	---	4.9	4.9	2.4	---	---	---
<u>Radulinus asprellus</u>	9.8	---	---	9.8	---	---	---	---
<u>Raja binoculata</u>	4.9	---	---	---	---	4.9	---	---
<u>Sebastes proriger</u>	4.9	---	---	2.4	2.4	---	---	---
unknown small flatfish	2.4	2.4	---	---	---	---	---	---
<u>Eptatretus</u> sp.	2.4	---	---	---	2.4	---	---	---
<u>Sebastes pinniger</u>	2.4	---	---	---	---	2.4	---	---
<u>Sebastes</u> sp. (juvenile)	2.4	2.4	---	---	---	---	---	---
<u>Hexagrammos decagrammus</u>	2.4	---	---	---	2.4	---	---	---
<u>Ophiodon elongatus</u>	2.4	---	---	---	---	---	2.4	---
<u>Careproctus melanurus</u>	2.4	---	---	2.4	---	---	---	---
<u>Glyptocephalus zachirus</u>	2.4	---	2.4	---	---	---	---	---

SCHOOLING FISHES:

<u>Sebastes wilsoni</u>	73.4	---	---	73.4	---	---	---	---
-------------------------	------	-----	-----	------	-----	-----	-----	-----

ALL FISHES:

Total density: 2577.8

Diversity indices: Richness (S) = 20 Evenness (J) = 0.51 Diversity (H') = 1.54

INVERTEBRATES: (100.0 % of videotape usable)

	Estimated density (#/hectare)
<u>Allocentrotus fragilis</u>	5253.6
Pachastrellidae-like	1735.7
<u>Ophiacantha</u> sp.	653.6
<u>Scypha/Iophon</u>	232.6
<u>Pycnopodia/Rathbunaster</u>	68.5
white fennistrate sponge	58.8
<u>Parastichopus</u> spp.	46.5
galathidid	26.9
<u>Staurocalyptus</u> -like	17.1
<u>Mediaster aequalis</u>	9.8
<u>Octopus dofleini</u>	7.3
<u>Octopus rubescens</u>	7.3
<u>Henricia</u> sp.	4.9

Diversity indices: Richness (S) = 13 Evenness (J) = 0.42 Diversity (H') = 1.08

OTHER ORGANISMS PRESENT:

None

(Dive 88H6B continued)

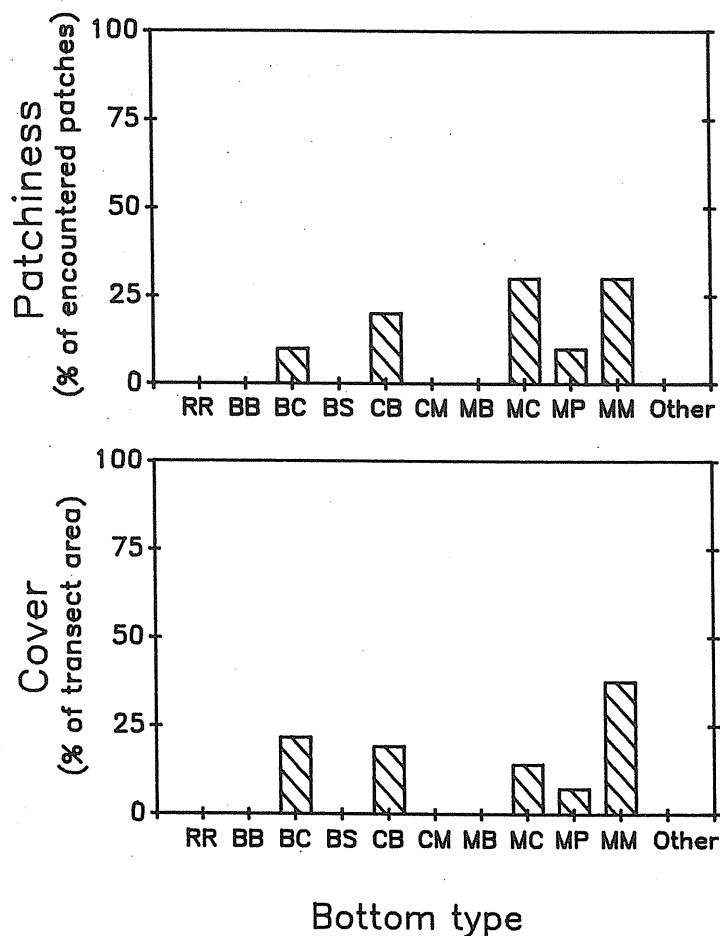
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
MM	Mud	37.6	30.0
BC	Boulder + Cobble	21.7	10.0
CB	Cobble + Boulder	19.2	20.0
MC	Mud + Cobble	14.2	30.0
MP	Mud + Pebble	7.3	10.0

Richness (S) = 5

Patchiness: Evenness (J) = 0.94 Diversity (H') = 1.50

Cover: Evenness (J) = 0.92 Diversity (H') = 1.48



Dive Code: 1988 Heceta Bank, Station 6, Dive C (88H6C)

Delta Dive: 1281

Date: 9/14/88

Time: 0900-1010

Minimum Depth: 445 ft (136 m)

Maximum Depth: 1175 ft (358 m)

Remarks: Visibility 15-20 feet; end of transect temperature 6.0 C

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes zacentrus</u>	981.8	11.6	501.3	438.9	30.0	---	---	---
<u>Sebastes wilsoni</u>	217.2	---	210.2	6.9	---	---	---	---
<u>Sebastes helvomaculatus</u>	164.0	2.3	87.8	71.6	2.3	---	---	---
<u>Hydrolagus colliei</u>	23.1	---	---	---	9.2	13.9	---	---
<u>Sebastes pinniger</u>	18.5	---	---	---	---	18.5	---	---
unknown mottled sculpin	18.5	---	11.6	6.9	---	---	---	---
<u>Sebastes</u> sp. (juvenile)	6.9	4.6	---	2.3	---	---	---	---
<u>Sebastes elongatus</u>	4.6	---	---	4.6	---	---	---	---
<u>Sebastes proriger</u>	4.6	---	---	---	4.6	---	---	---
<u>Sebastes ruberrimus</u>	4.6	---	---	---	---	---	2.3	2.3
<u>Sebastes alutus</u>	2.3	---	---	2.3	---	---	---	---
<u>Sebastes paucispinis</u>	2.3	---	---	---	---	---	2.3	---
<u>Hexagrammos decagrammus</u>	2.3	---	---	---	2.3	---	---	---
unknown blenny-like fish	2.3	---	2.3	---	---	---	---	---
<u>Microstomus pacificus</u>	2.3	---	---	---	2.3	---	---	---

SCHOOLING FISHES:

<u>Sebastes zacentrus</u>	85.5	---	57.8	27.7	---	---	---	---
<u>Sebastes wilsoni</u>	57.8	---	57.8	---	---	---	---	---

ALL FISHES:

Total density: 1598.7

Diversity indices: Richness (S) = 14 Evenness (J) = 0.41 Diversity (H') = 1.07

INVERTEBRATES: species present

Allocentrotus fragilis
Anthomastus ritteri (?)
Corolla spetalatis
Florometra serratissima
Henricia spp.
Lophogorgia-like
Mediaster aequalis
Neptunea sp.
Octopus dofleini
Octopus sp.
Ophiacantha sp.
Pagurus spp.
Parastichopus spp.
Pycnopodia helianthoides
Rathbunaster californicus
Stomphia coccinea
Swiftia spp.
unknown barrel sponge
unknown shelf sponge
unknown vase sponge
unknown white fenestrated sponge

(Dive 88H6C continued)

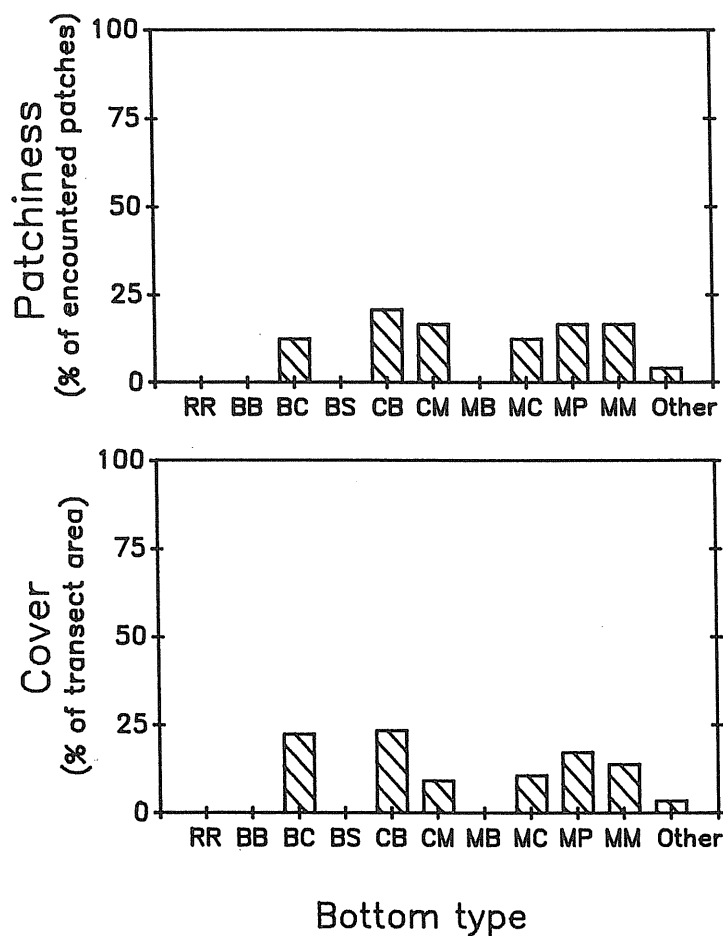
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
CB	Cobble + Boulder	23.3	20.8
BC	Boulder + Cobble	22.3	12.5
MP	Mud + Pebble	17.2	16.7
MM	Mud	13.8	16.7
MC	Mud + Cobble	10.7	12.5
CM	Cobble + Mud	9.2	16.7
PM	Pebble + Mud	0.5	4.2

Richness (S) =

Patchiness: Evenness (J) = 0.96 Diversity (H') = 1.87

Cover: Evenness (J) = 0.89 Diversity (H') = 1.84



Dive Code: 1989 Heceta Bank, Station 1, Dive A (89H1A)

Delta Dive: 1511

Date: 9/02/89

Time: 1056-1214

Minimum Depth: 230 ft (72 m)

Maximum Depth: 255 ft (78 m)

Remarks: 40 feet visibility

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes</u> sp. (juvenile)	491.0	491.0	---	---	---	---	---	---
<u>Sebastes helvomaculatus</u>	204.2	---	61.9	135.4	6.9	---	---	---
<u>Ophiodon elongatus</u>	27.5	---	---	2.3	4.6	6.9	2.3	11.5
<u>Lycodes corteziensis</u>	25.2	4.6	20.6	---	---	---	---	---
<u>Hexagrammos decagrammus</u>	22.9	2.3	---	13.8	6.9	---	---	---
unknown fish	20.6	16.1	4.6	---	---	---	---	---
<u>Sebastes ruberrimus</u>	9.2	---	2.3	2.3	2.3	---	2.3	---
<u>Hydrolagus colliei</u>	9.2	---	---	---	---	6.9	2.3	---
<u>Sebastes pinniger</u>	9.2	---	---	---	---	6.9	2.3	---
<u>Sebastes flavidus</u>	6.9	---	---	---	---	6.9	---	---
<u>Rathbunella</u> sp.	4.6	4.6	---	---	---	---	---	---
<u>Coryphopterus nicholsii</u> (?)	4.6	---	4.6	---	---	---	---	---
<u>Raja rhina</u>	4.6	---	---	---	---	---	---	4.6
<u>Agonus acipenserinus</u>	2.3	---	---	2.3	---	---	---	---
<u>Eopsetta jordani</u>	2.3	---	---	2.3	---	---	---	---
<u>Parophrys vetulus</u>	2.3	---	---	2.3	---	---	---	---
<u>Anarrhichthys ocellatus</u>	2.3	---	---	---	---	---	---	2.3

SCHOOLING FISHES:

<u>Sebastes</u> sp. (juvenile)	17033.4	17005.9	27.5	---	---	---	---	---
--------------------------------	---------	---------	------	-----	-----	-----	-----	-----

ALL FISHES:

Total density: 17882.3

Diversity indices: Richness (S) = 15 Evenness (J) = 0.59 Diversity (H') = 1.60

INVERTEBRATES: (59.3 % of videotape usable)

	Estimated density (#/hectare)
<u>Scypha/Iophon</u>	3641.2
<u>Henricia</u> spp.	84.9
<u>Lophogorgia</u> -like	68.8
<u>Parastichopus</u> spp.	59.7
<u>Mediaster aequalis</u>	45.9
<u>Patiria miniata</u>	13.8
<u>Pycnopodia helianthoides</u>	11.5
<u>Allocentrotus fragilis</u>	9.2
<u>Ophiacantha</u> sp.	9.2
<u>Geodia</u> -like	6.9
<u>Hippasterias</u> spp.	6.9
<u>Urticina piscivora</u>	6.9
unidentified snail	6.9
<u>Florometra serratissima</u>	4.6
Pachastrellidae-like	4.6
<u>Aphrocallistes/Mycale</u>	2.3
<u>Derasterias imbricata</u>	2.3
<u>Gorgonocephalus eucinemis</u>	2.3

Diversity indices: Richness (S) = 18 Evenness (J) = 0.17 Diversity (H') = 0.49

OTHER ORGANISMS PRESENT:

Encrusting red algae

Codium sp.

Beggiotoa spp. (bacterial mat)

(Dive 89H1A continued)

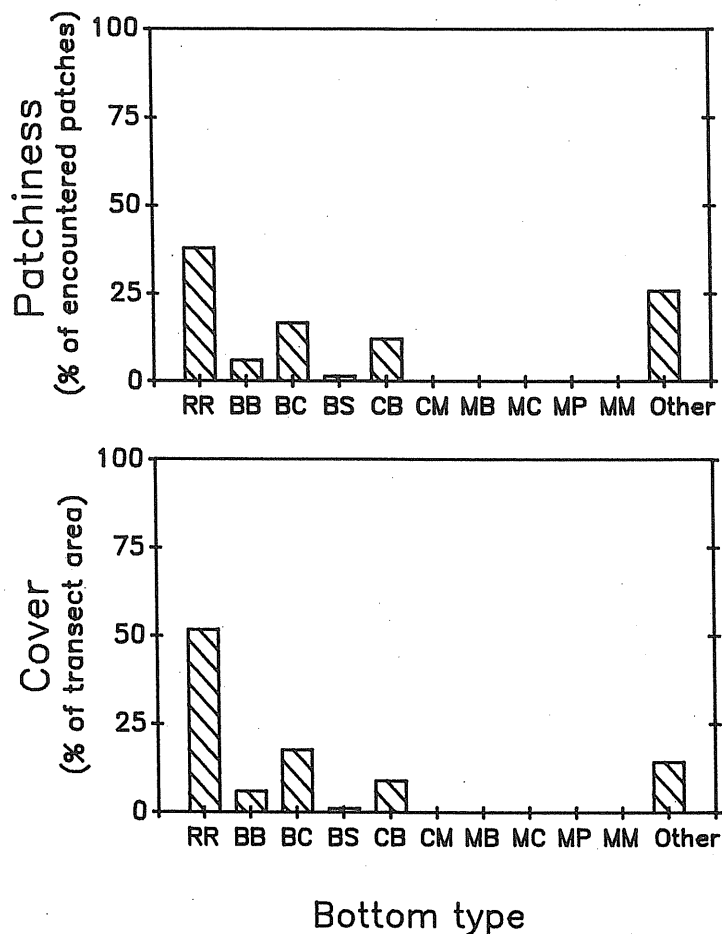
BOTTOM TYPE: (80% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
RR	Rock Ridge	51.7	37.9
BC	Boulder + Cobble	17.7	16.7
CB	Cobble + Boulder	9.0	12.1
BB	Boulder	6.0	6.1
SC	Sand + Cobble	5.0	6.1
SS	Sand	2.4	6.1
CS	Cobble + Sand	1.9	1.5
SP	Sand + Pebble	1.8	4.5
CP	Cobble + Pebble	1.5	3.0
BS	Boulder + Sand	1.2	1.5
CC	Cobble	1.2	3.0
SB	Sand + Boulder	0.6	1.5

Richness (S) = 12

Patchiness: Evenness (J) = 0.80 Diversity (H') = 1.97

Cover: Evenness (J) = 0.65 Diversity (H') = 1.62



DiveCode:1989 Heceta Bank, Station 1, Dive B (89H1B)

Delta Dive: 1512

Date: 9/02/89

Time: 1402-1519

Minimum Depth: 230 ft (70 m)

Maximum Depth: 250 ft (76 m)

Remarks: Compass problems; strong current

Estimated density (#/hectare) by total length

Scientific Name	Total	0 dm	1 dm	2 dm	3 dm	4 dm	5 dm	≥ 5 dm
NON-SCHOOLING FISHES:								
<u>Sebastes helvomaculatus</u>	274.6	---	4.7	167.6	102.4	---	---	---
<u>Hexagrammos decagrammus</u>	51.2	---	---	---	14.0	37.2	---	---
<u>Sebastes flavidus</u>	46.6	---	---	---	---	46.6	---	---
<u>Coryphopterus nicholsii</u> (?)	46.6	---	---	---	---	---	---	---
<u>Rathbunella</u> sp.	32.6	---	27.9	4.7	---	---	---	---
<u>Sebastes pinniger</u>	23.3	---	---	---	---	4.7	9.3	9.3
<u>Ophiodon elongatus</u>	14.0	---	---	---	4.7	---	4.7	4.7
<u>Sebastes ruberrimus</u>	9.3	---	---	9.3	---	---	---	---
<u>Sebastes</u> sp. (juvenile)	9.3	---	---	---	---	---	---	---
<u>Radulinus asprellus</u>	4.7	---	---	4.7	---	---	---	---

SCHOOLING FISHES:

<u>Sebastes</u> sp.(juvenile)	38637.0	30637.0	---	---	---	---	---	---
<u>Sebastes flavidus</u>	493.4	---	---	---	---	---	479.5	---
<u>Sebastes entomelas</u>	46.6	---	---	---	---	---	46.6	---

ALL FISHES:

Total density: 39689.0

Diversity indices: Richness (S) = 10 Evenness (J) = 0.62 Diversity (H') = 1.44

INVERTEBRATES: (71.7 % of videotape usable)

	Estimated density (#/hectare)
<u>Scypha/Iophon</u>	12340.6
<u>Henricia</u> spp.	772.7
<u>Gorgonocephalus eucinemis</u>	335.2
Pachastrellidae-like	195.5
<u>Mediaster aequalis</u>	139.7
<u>Parastichopus</u> spp.	116.4
<u>Pycnopodia helianthoides</u>	102.4
<u>Pteraster</u> spp.	60.5
<u>Urticina piscivora</u>	32.6
<u>Patiria miniata</u>	27.9
unidentified snail	23.3
<u>Evasterias troschelii</u>	14.0
<u>Hippasterias</u> spp.	14.0
<u>Stylasterias forreri</u>	14.0
<u>Florometra serratissima</u>	9.3
<u>Lophogorgia</u> -like	4.7
<u>Octopus rubescens</u>	4.7
<u>Ophiacantha</u> sp.	4.7
<u>Pteraster militaris</u>	4.7

Diversity indices: Richness (S) = 19 Evenness (J) = 0.22 Diversity (H') = 0.64

OTHER ORGANISMS PRESENT:

Beggiotoa spp. (bacterial mat)
 Encrusting Red Algae
Codium fragile
 Folious Red Algae

(Dive 89H1B continued)

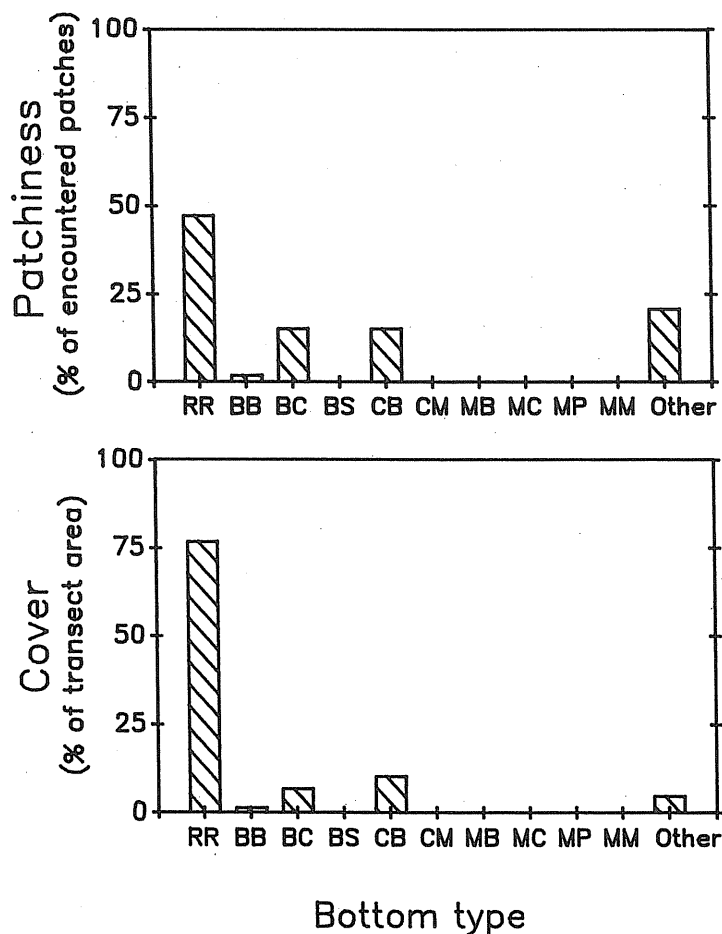
BOTTOM TYPE: (98% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
RR	Rock Ridge	76.7	47.2
CB	Cobble + Boulder	10.3	15.1
BC	Boulder + Cobble	6.9	15.1
SC	Sand + Cobble	1.7	7.5
CC	Cobble	1.6	5.7
BB	Boulder	1.4	1.9
SB	Sand + Boulder	0.7	1.9
SS	Sand	0.4	3.8
CS	Cobble + Sand	0.3	1.9

Richness (S) = 9

Patchiness: Evenness (J) = 0.74 Diversity (H') = 1.63

Cover: Evenness (J) = 0.40 Diversity (H') = 0.89



Dive Code: 1989 Heceta Bank, Station 2, Dive A (89H2A)

Delta Dive: 1513

Date: 9/03/89

Time: 1110-1231

Minimum Depth: 450 ft (137 m)

Maximum Depth: 495 ft (151 m)

Remarks: None

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes wilsoni</u>	283.6	---	93.8	182.8	7.0	---	---	---
<u>Sebastes helvomaculatus</u>	133.6	---	39.8	84.4	9.4	---	---	---
<u>Sebastes zacentrus</u>	124.2	---	37.5	72.7	14.1	---	---	---
<u>Sebastes elongatus</u>	89.1	---	11.7	60.9	16.4	---	---	---
unknown mottled sculpin	82.0	25.8	49.2	7.0	---	---	---	---
<u>Microstomus pacificus</u>	56.3	4.7	16.4	9.4	21.1	4.7	---	---
<u>Rathbunella</u> sp.	28.1	---	25.8	2.3	---	---	---	---
unknown small flatfish	18.8	11.7	4.7	---	---	2.3	---	---
<u>Icelinus</u> sp. (?)	16.4	---	---	16.4	---	---	---	---
<u>Paricelius hopliticus</u>	14.1	---	11.7	2.3	---	---	---	---
<u>Glyptocephalus zachirus</u>	14.1	---	7.0	4.7	2.3	---	---	---
unknown mottled poacher	9.4	2.3	7.0	---	---	---	---	---
<u>Raja rhina</u>	9.4	---	---	---	---	2.3	---	7.0
<u>Lycodes corteziianus</u>	7.0	---	2.3	4.7	---	---	---	---
<u>Agonus acipenserinus</u>	4.7	---	4.7	---	---	---	---	---
<u>Icelinus filamentosus</u>	4.7	---	4.7	---	---	---	---	---
unknown blenny-like fish	4.7	---	4.7	---	---	---	---	---
unknown fish	2.3	2.3	---	---	---	---	---	---
<u>Sebastes</u> sp. (blotched)	2.3	---	2.3	---	---	---	---	---
<u>unknown prickleback</u> (?)	2.3	---	2.3	---	---	---	---	---
<u>Eopsetta jordani</u>	2.3	---	---	---	---	2.3	---	---
<u>Sebastes chlorostictus</u>	2.3	---	---	---	---	---	2.3	---
<u>Merluccius productus</u>	2.3	---	---	---	---	---	---	2.3
<u>Ophiodon elongatus</u>	2.3	---	---	---	---	---	---	2.3

SCHOOLING FISHES:

<u>Sebastes wilsoni</u>	644.6	---	---	644.6	---	---	---	---
<u>Sebastes</u> sp. (juvenile)	281.3	281.3	---	---	---	---	---	---

ALL FISHES:

Total density: 1842.3

Diversity indices: Richness (S) = 22 Evenness (J) = 0.51 Diversity (H') = 1.57

INVERTEBRATES: (91.1 % of videotape usable)

Estimated
density
(#/hectare)

<u>Allocentrotus fragilis</u>	3954.1
<u>Scypha/Iophon</u>	1319.6
<u>Ophiacantha</u> sp.	832.1
<u>Parastichopus</u> spp.	208.6
<u>Pachastrellidae</u> -like	68.0
<u>Florometra serratissima</u>	60.9
<u>Metridium senile</u>	51.6
<u>Aphrocallistes/Mycale</u>	39.8
<u>Archidoris odhneri/Discodoris</u>	35.2
<u>Staurocalyptus</u> -like	35.2
<u>Henricia</u> spp.	32.8
<u>Lophogorgia</u> -like	32.8
<u>Luidia foliolata</u>	9.4
<u>Poraniopsis inflata</u>	9.4
<u>Ophiura sarsii</u>	4.7
<u>Lophaster/Asterias</u>	2.3
<u>Lopholithodes foraminatus</u>	2.3
<u>Neptunea/Neptuneidae</u>	2.3
<u>Stylatula elongata</u>	2.3

Diversity indices:

Richness (S) = 19

Evenness (J) = 0.44

Diversity (H') = 1.30

OTHER ORGANISMS PRESENT:

Beggiotoa spp.

(Dive 89H2A continued)

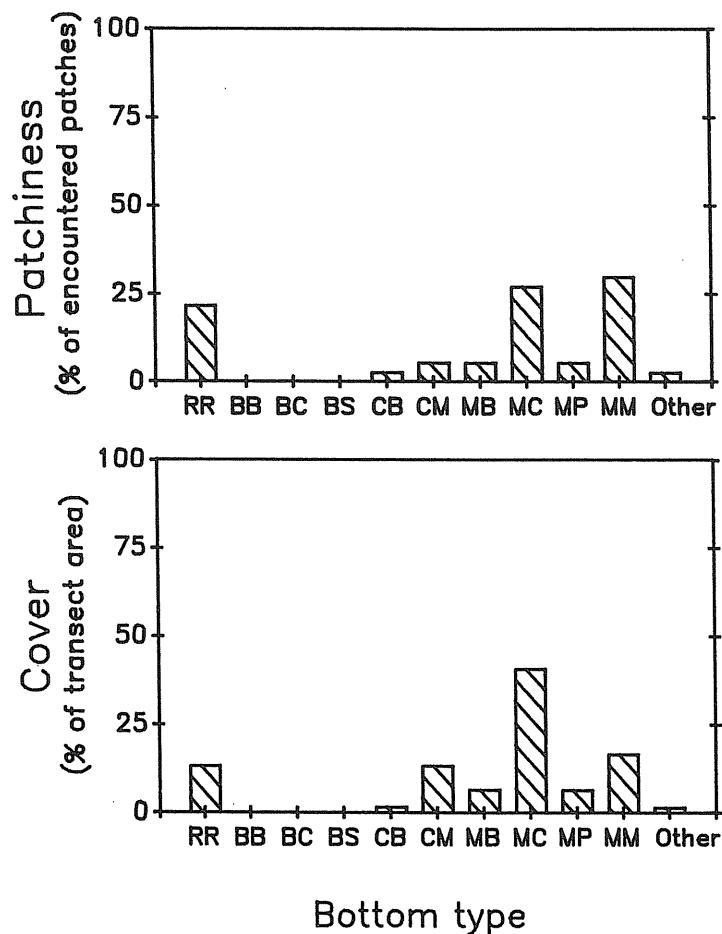
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
MC	Mud + Cobble	40.7	27.0
MM	Mud	16.6	29.7
CM	Cobble + Mud	13.3	5.4
RR	Rock Ridge	13.3	21.6
MB	Mud + Boulder	6.5	5.4
MP	Mud + Pebble	6.4	5.4
CB	Cobble + Boulder	1.6	2.7
BM	Boulder + Mud	1.5	2.7

Richness (S) = 8

Patchiness: Evenness (J) = 0.82 Diversity (H') = 1.71

Cover: Evenness (J) = 0.81 Diversity (H') = 1.69



Bottom type

Dive Code: 1989 Heceta Bank, Station 2, Dive B (89H2B)

Delta Dive: 1514

Date: 9/03/89

Time: 1351-1508

Minimum Depth: 455 ft (139 m)

Maximum Depth: 510 ft (155 m)

Remarks: None

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes wilsoni</u>	335.4	---	137.7	185.2	12.5	---	---	---
<u>Icelinus filamentosus</u>	125.2	12.5	95.1	10.0	2.5	---	---	---
<u>Sebastes helvomaculatus</u>	87.6	---	32.5	47.6	7.5	---	---	---
<u>Lyopsetta exilis</u>	82.6	---	60.1	20.0	2.5	---	---	---
<u>Sebastes zacentrus</u>	82.6	---	42.6	35.0	5.0	---	---	---
<u>Lycodes cortezianus</u>	65.1	2.5	40.0	22.5	---	---	---	---
<u>Icelinus</u> sp. (?)	57.6	---	22.5	25.0	5.0	---	---	---
<u>Microstomus pacificus</u>	50.1	---	15.0	20.0	10.0	5.0	---	---
<u>Sebastes elongatus</u>	22.5	2.5	2.5	7.5	10.0	---	---	---
unknown fish	15.0	5.0	2.5	2.5	2.5	---	---	---
<u>Eptatretus</u> sp.	12.5	---	---	---	---	12.5	---	---
<u>Glyptocephalus zachirus</u>	10.0	---	---	2.5	7.5	---	---	---
<u>Agonus acipenserinus</u>	7.5	---	7.5	---	---	---	---	---
unknown small flatfish	5.0	5.0	---	---	---	---	---	---
<u>Raja rhina</u>	5.0	---	---	---	---	---	---	5.0
<u>Sebastes</u> sp. (juvenile)	2.5	2.5	---	---	---	---	---	---
<u>Ophiodon elongatus</u>	2.5	---	---	---	---	---	2.5	---
<u>Merluccius productus</u>	2.5	---	---	---	---	---	---	2.5
<u>Sebastes ruberrimus</u>	2.5	---	---	---	---	---	---	2.5

SCHOOLING FISHES:

<u>Lycodes cortezianus</u>	5.0	---	---	---	---	---	---	---
<u>Lyopsetta exilis</u>	2.5	2.5	---	---	---	---	---	---

ALL FISHES:

Total density: 981.2

Diversity indices: Richness (S) = 16 Evenness (J) = 0.76 Diversity (H') = 2.10

INVERTEBRATES: (97.0 % of videotape usable)

	Estimated density (#/hectare)
<u>Allocentrotus fragilis</u>	4866.0
<u>Ophiacantha</u> sp.	2180.2
<u>Scypha/Iophon</u>	896.1
<u>Lophogorgia</u> -like	112.6
Pachastrellidae-like	70.1
<u>Archidoris odhneri/Discodoris</u>	50.1
<u>Aphrocallistes/Mycale</u>	32.5
<u>Henricia</u> spp.	32.5
<u>Luidia foliolata</u>	20.0
<u>Poraniopsis inflata</u>	12.5
<u>Urticina piscivora</u>	5.0
<u>Lopholithodes foraminatus</u>	2.5
<u>Metridium senile</u>	2.5
<u>Ophiura sarsii</u>	2.5
pagurids	2.5

Diversity indices: Richness (S) = 15 Evenness (J) = 0.41 Diversity (H') = 1.12

OTHER ORGANISMS PRESENT:

Beggiotoa spp. (bacterial mat)

(Dive 89H2B continued)

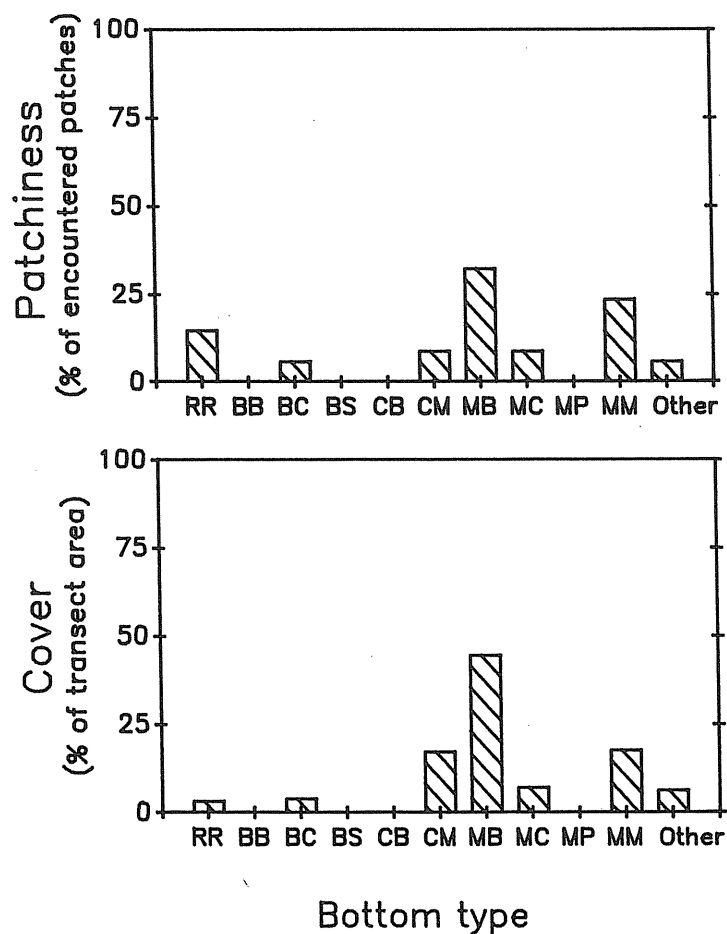
BOTTOM TYPE: (82% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
MB	Mud + Boulder	44.5	32.4
MM	Mud	17.7	23.5
CM	Cobble + Mud	17.2	8.8
MC	Mud + Cobble	7.1	8.8
BM	Boulder + Mud	6.3	5.9
BC	Boulder + Cobble	4.0	5.9
RR	Rock Ridge	3.2	14.7

Richness (S) = 7

Patchiness: Evenness (J) = 0.90 Diversity (H') = 1.75

Cover: Evenness (J) = 0.81 Diversity (H') = 1.57



Dive Code: 1989 Heceta Bank, Station 3, Dive A (89H3A)

Delta Dive: 1515

Date: 9/03/89

Time: 1805-1909

Minimum Depth: 240 ft (73 m)

Maximum Depth: 300 ft (91 m)

Remarks: 50 feet visibility; out of ballast air due to pinnacles

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
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NON-SCHOOLING FISHES:

<u>Sebastes helvomaculatus</u>	330.5	---	23.3	242.1	55.9	4.7	---	---
<u>Radulinus asprellus</u>	288.6	---	270.0	18.6	---	---	---	---
<u>Sebastes wilsoni</u>	121.0	---	88.4	18.6	14.0	---	---	---
<u>Sebastes</u> sp. (juvenile)	88.4	---	4.7	---	---	---	---	---
<u>Sebastes flavidus</u>	79.1	---	---	---	---	37.2	41.9	---
<u>Rathbunella</u> sp.	51.2	---	51.2	---	---	---	---	---
<u>Ophiodon elongatus</u>	41.9	---	---	---	---	---	14.0	27.9
<u>Hexagrammos decagrammus</u>	23.3	---	---	---	4.7	18.6	---	---
<u>Sebastes pinniger</u>	14.0	---	---	---	---	---	4.7	9.3
<u>Sebastes entomelas</u>	9.3	---	---	---	---	9.3	---	---
<u>Raja binoculata</u>	9.3	---	---	---	---	---	---	9.3
<u>Hydrolagus colliei</u>	4.7	---	---	---	---	4.7	---	---

SCHOOLING FISHES:

<u>Sebastes wilsoni</u>	6526.4	---	6005.0	521.4	---	---	---	---
<u>Sebastes</u> sp. (juvenile)	2630.1	46.6	---	---	---	---	---	---
<u>Sebastes flavidus</u>	228.1	---	---	---	---	14.0	214.1	---
<u>Sebastes entomelas</u>	9.3	---	---	---	9.3	---	---	---

ALL FISHES:

Total density: 10455.3

Diversity indices: Richness (S) = 11 Evenness (J) = 0.26 Diversity (H') = 0.63

INVERTEBRATES: (85.3 % of videotape usable)

	Estimated density (#/hectare)
<u>Scypha/Iophon</u>	42845.2
<u>Florometra serratissima</u>	29201.2
<u>Ophiacantha</u> sp.	419.0
<u>Henricia</u> spp.	367.7
<u>Parastichopus</u> spp.	316.5
Pachastrellidae-like	190.9
<u>Gorgonocephalus eucinemis</u>	125.7
<u>Allocentrotus fragilis</u>	88.4
<u>Mediaster aequalis</u>	88.4
<u>Hippasterias</u> spp.	46.6
<u>Pycnopodia helianthoides</u>	41.9
<u>Aphrocallistes/Mycale</u>	18.6
<u>Pteraster</u> spp.	14.0
<u>Archidoris odhneri/Discodoris</u>	9.3
<u>Luidia foliolata</u>	9.3
<u>Lophogorgia</u> -like	4.7
<u>Octopus rubescens</u>	4.7
<u>Staurocalyptus</u> -like	4.7
purple globular sponge	4.7

Diversity indices: Richness (S) = 19 Evenness (J) = 0.28 Diversity (H') = 0.82

OTHER ORGANISMS PRESENT:

Encrusting Red Algae

Codium sp.

(Dive 89H3A continued)

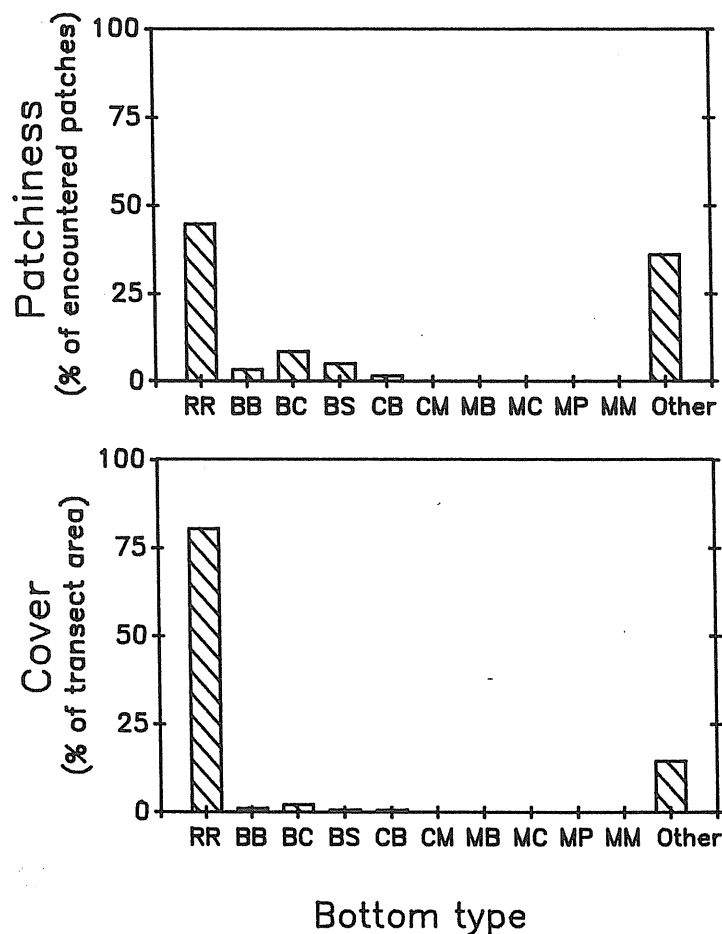
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
RR	Rock Ridge	80.5	44.8
TT	Pinnacles	8.1	5.2
SS	Sand	3.6	17.2
BC	Boulder + Cobble	2.3	8.6
BB	Boulder	1.2	3.4
SP	Sand + Pebble	1.1	3.4
BS	Boulder + Sand	0.7	5.2
CB	Cobble + Boulder	0.7	1.7
SB	Sand + Boulder	0.7	3.4
CS	Cobble + Sand	0.7	3.4
PP	Pebble	0.2	1.7
SC	Sand + Cobble	0.1	1.7

Richness (S) = 12

Patchiness: Evenness (J) = 0.75 Diversity (H') = 1.85

Cover: Evenness (J) = 0.34 Diversity (H') = 0.85



Dive Code: 1989 Heceta Bank, Station 3, Dive B (89H3B)

Delta Dive: 1517

Date: 9/04/89

Time: 1314-1438

Minimum Depth: 240 ft (73 m)

Maximum Depth: 350 ft (107 m)

Remarks: None

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes helvomaculatus</u>	162.3	---	39.1	123.2	---	---	---	---
<u>Paricelius hopliticus</u>	31.3	---	31.3	---	---	---	---	---
<u>Sebastes elongatus</u>	19.5	---	---	17.6	2.0	---	---	---
<u>Sebastes flavidus</u>	17.6	---	---	---	3.9	2.0	11.7	---
<u>Hexagrammos decagrammus</u>	15.6	---	---	---	15.6	---	---	---
unknown mottled sculpin	13.7	---	11.7	2.0	---	---	---	---
unknown fish	9.8	2.0	3.9	3.9	---	---	---	---
unknown prickleback (?)	7.8	---	2.0	5.9	---	---	---	---
<u>Ophiodon elongatus</u>	5.9	---	2.0	---	---	---	2.0	2.0
unknown small flatfish	3.9	3.9	---	---	---	---	---	---
<u>Sebastes</u> sp. (blotched)	3.9	---	3.9	---	---	---	---	---
<u>Rathbunella</u> sp.	2.0	---	2.0	---	---	---	---	---
unknown blenny-like fish	2.0	---	2.0	---	---	---	---	---
<u>Icelinus</u> sp. (?)	2.0	---	---	2.0	---	---	---	---
<u>Sebastes wilsoni</u>	2.0	---	---	2.0	---	---	---	---
<u>Microstomus pacificus</u>	2.0	---	---	---	2.0	---	---	---
<u>Sebastes</u> sp. (juvenile)	2.0	---	---	---	2.0	---	---	---
unknown flatfish	2.0	---	---	---	2.0	---	---	---
<u>Raja rhina</u>	2.0	---	---	---	---	---	---	2.0
<u>Raja</u> sp.	2.0	---	---	---	---	---	---	2.0

SCHOOLING FISHES:

<u>Sebastes flavidus</u>	2023.4	1955.0	---	---	---	---	68.4	---
<u>Sebastes wilsoni</u>	977.5	---	977.5	---	---	---	---	---
<u>Sebastes</u> sp. (juvenile)	586.5	586.5	---	---	---	---	---	---

ALL FISHES:

Total density: 3896.2

Diversity indices: Richness (S) = 16 Evenness (J) = 0.36 Diversity (H') = 0.99

INVERTEBRATES: (73.3 % of videotape usable)

	Estimated density (#/hectare)
<u>Scypha/Iophon</u>	10427.7
<u>Florometra serratissima</u>	5475.8
<u>Ophiacantha</u> sp.	406.6
<u>Parastichopus</u> spp.	142.7
Pachastrellidae-like	138.8
<u>Mediaster aequalis</u>	109.5
<u>Henricia</u> spp.	107.5
<u>Allocentrotus fragilis</u>	86.0
<u>Gorgonocephalus eucinemis</u>	52.8
<u>Pteraster</u> spp.	50.8
<u>Pycnopodia helianthoides</u>	17.6
<u>Lophaster/Asterias</u>	13.7
<u>Stylasterias forreri</u>	13.7
<u>Heteropora magna</u>	5.9
<u>Aphrocallistes/Mycale</u>	3.9
<u>Lophogorgia</u> -like	3.9
<u>Poraniopsis inflata</u>	3.9
<u>Solaster</u> sp.	3.9
<u>Allopora californica</u>	2.0
<u>Crossaster papposus</u>	2.0
<u>Hippasterias</u> spp.	2.0
<u>Luidia foliolata</u>	2.0
<u>Orthasterias koehleri</u>	2.0
<u>Patiria miniata</u>	2.0

Diversity indices:

Richness (S) = 24

Evenness (J) = 0.31

Diversity (H') = 1.00

OTHER ORGANISMS PRESENT:

Encrusting Red Algae

Codium sp.

(Dive 89H3B continued)

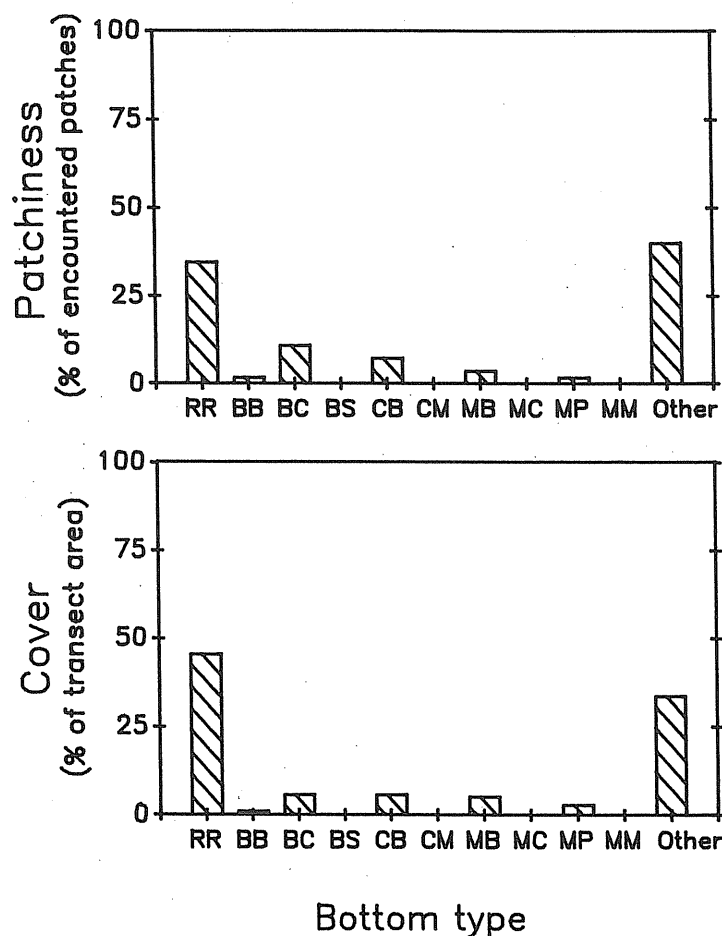
BOTTOM TYPE: (94% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
RR	Rock Ridge	45.5	34.5
CP	Cobble + Pebble	14.5	9.1
SS	Sand	6.8	12.7
BC	Boulder + Cobble	5.8	10.9
CB	Cobble + Boulder	5.7	7.3
MB	Mud + Boulder	5.2	3.6
PM	Pebble + Mud	5.0	1.8
MP	Mud + Pebble	3.0	1.8
PS	Pebble + Sand	2.6	3.6
SP	Sand + Pebble	1.7	3.6
CC	Cobble	1.2	1.8
BB	Boulder	1.1	1.8
SC	Sand + Cobble	0.8	3.6
CS	Cobble + Sand	0.8	1.8
SB	Sand + Boulder	0.3	1.8

Richness (S) = 15

Patchiness: Evenness (J) = 0.81 Diversity (H') = 2.20

Cover: Evenness (J) = 0.71 Diversity (H') = 1.92



Dive Code: 1989 Heceta Bank, Station 4, Dive A (89H4A)

Delta Dive: 1524

Date: 9/08/89

Time: 1131-1247

Minimum Depth: 418 ft (127 m)

Maximum Depth: 430 ft (131 m)

Remarks: Visibility poor (10-15 feet); no gyroscope

Estimated density (#/hectare) by total length

Scientific Name	Total	0 dm	1 dm	2 dm	3 dm	4 dm	5 dm	> 5 dm
NON-SCHOOLING FISHES:								
<u>Sebastes wilsoni</u>	3062.6	---	84.5	2945.1	33.0	---	---	---
<u>Sebastes zacentrus</u>	1994.0	3.7	33.0	1916.9	40.4	---	---	---
<u>Sebastes helvomaculatus</u>	348.9	---	11.0	249.7	88.1	---	---	---
<u>Radulinus asprellus</u>	315.8	---	290.1	25.7	---	---	---	---
<u>Lyopsetta exilis</u>	124.9	---	88.1	36.7	---	---	---	---
<u>Sebastes elongatus</u>	69.8	---	---	40.4	25.7	3.7	---	---
<u>Sebastes pinniger</u>	51.4	---	---	---	---	---	25.7	25.7
<u>Rathbunella</u> sp.	47.7	---	40.4	7.3	---	---	---	---
<u>Microstomus pacificus</u>	29.4	---	---	11.0	18.4	---	---	---
<u>Sebastes flavidus</u>	25.7	---	---	---	---	3.7	7.3	14.7
<u>Icelinus filamentosus</u>	22.0	---	3.7	18.4	---	---	---	---
unknown mottled poacher	14.7	---	14.7	---	---	---	---	---
<u>Sebastes ruberrimus</u>	14.7	---	---	3.7	---	---	3.7	7.3
<u>Sebastes</u> sp. (juvenile)	11.0	7.3	3.7	---	---	---	---	---
<u>Eptatretus</u> sp.	7.3	---	---	---	7.3	---	---	---
<u>Agonus acipenserinus</u>	3.7	---	---	3.7	---	---	---	---
unknown flatfish	3.7	---	---	3.7	---	---	---	---
<u>Glyptocephalus zachirus</u>	3.7	---	---	---	3.7	---	---	---
<u>Hydrolagus colliei</u>	3.7	---	---	---	---	---	3.7	---
<u>Ophiodon elongatus</u>	3.7	---	---	---	---	---	---	3.7
SCHOOLING FISHES:								
<u>Sebastes wilsoni</u>	9804.6	---	73.4	9731.2	---	---	---	---
<u>Sebastes</u> sp. (uvenile)	1714.9	1714.9	---	---	---	---	---	---
<u>Sebastes flavidus</u>	727.1	22.0	---	---	---	---	18.4	686.7
<u>Sebastes zacentrus</u>	550.8	---	---	550.8	---	---	---	---

ALL FISHES:

Total density: 18955.6

Diversity indices: Richness (S) = 18 Evenness (J) = 0.32 Diversity (H') = 0.92

INVERTEBRATES: (90.7 % of videotape usable)

	Estimated density (#/hectare)
<u>Florometra serratissima</u>	11941.8
<u>Ophiacantha</u> sp.	8119.1
<u>Scypha/Iophon</u>	5254.8
<u>Pachastrellidae-like</u>	356.2
<u>Henricia</u> sp.	176.3
<u>Allocentrotus fragilis</u>	132.2
<u>Mycale-like</u>	91.8
<u>Parastichopus californicus</u>	84.5
<u>Pteraster</u> spp.	84.5
<u>Pycnopodia helianthoides</u>	55.1
<u>Mediaster aequalis</u>	44.1
<u>Stylasterias forreri</u>	25.7
<u>Pycnopodia/Rathbunaster</u>	14.7
<u>Geodia-like</u>	7.3
<u>Hippasterias</u> spp.	7.3
<u>Crossaster papposus</u>	3.7
<u>Lopholithodes foraminatus</u>	3.7
<u>Solaster</u> sp.	3.7
<u>Stylasterias/Orthasterias</u>	3.7

Diversity indices:

Richness (S) = 19

Evenness (J) = 0.43

Diversity (H') = 1.26

OTHER ORGANISMS PRESENT:

None

(Dive 89H4A continued)

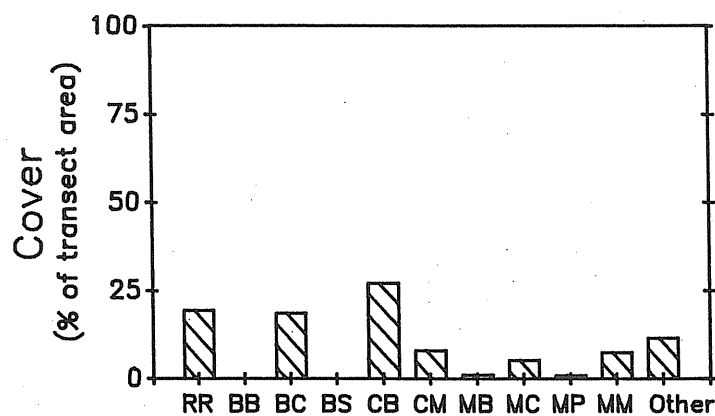
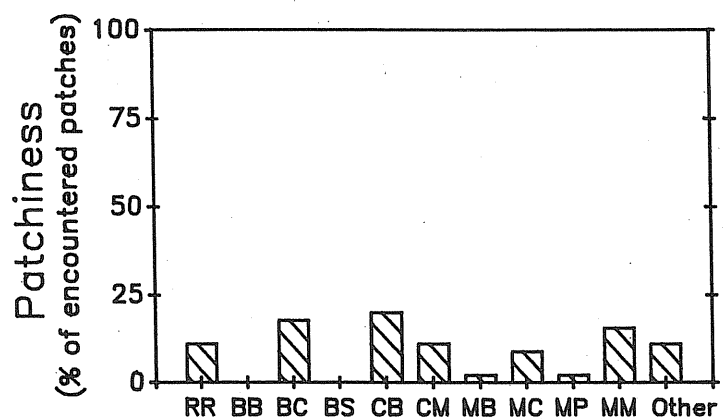
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
MM	Mud	77.3	38.5
CM	Cobble + Mud	10.8	23.1
MC	Mud + Cobble	8.2	30.8
MP	Mud + Pebble	3.8	7.7

Richness (S) = 4

Patchiness: Evenness (J) = 0.91 Diversity (H') = 1.27

Cover: Evenness (J) = 0.55 Diversity (H') = 0.77



Bottom type

Dive Code: 1989 Heceta Bank, Station 4, Dive B (89H4B)

Delta Dive: 1525

Date: 9/09/89

Time: 1343-1459

Minimum Depth: 410 ft (125 m)

Maximum Depth: 440 ft (134 m)

Remarks: None

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes wilsoni</u>	969.2	---	62.5	906.6	---	---	---	---
<u>Sebastes helvomaculatus</u>	165.2	---	22.3	125.1	17.9	---	---	---
<u>Sebastes zacentrus</u>	142.9	---	17.9	116.1	8.9	---	---	---
unknown mottled sculpin	100.5	8.9	75.9	13.4	2.2	---	---	---
<u>Sebastes elongatus</u>	42.4	---	4.5	24.6	13.4	---	---	---
<u>Sebastes</u> sp. (blotched)	29.0	2.2	22.3	4.5	---	---	---	---
<u>Rathbunella</u> sp.	22.3	---	20.1	2.2	---	---	---	---
<u>Microstomus pacificus</u>	22.3	---	2.2	6.7	11.2	2.2	---	---
<u>Sebastes alutus</u>	22.3	---	---	4.5	17.9	---	---	---
<u>Paricelius hopliticus</u>	13.4	---	6.7	6.7	---	---	---	---
<u>Sebastes flavidus</u>	13.4	---	---	---	2.2	8.9	2.2	---
<u>Sebastes pinniger</u>	11.2	---	---	---	4.5	---	6.7	---
<u>Sebastes ruberrimus</u>	11.2	---	---	---	---	---	11.2	---
<u>Glyptocephalus zachirus</u>	4.5	---	---	4.5	---	---	---	---
<u>Icelinus</u> sp. (?)	4.5	---	---	4.5	---	---	---	---
unknown prickleback (?)	4.5	---	---	4.5	---	---	---	---
<u>Psettichthys melanostictus</u>	2.2	---	2.2	---	---	---	---	---
unknown small flatfish	2.2	---	2.2	---	---	---	---	---
<u>Lyopsetta exilis</u>	2.2	---	---	2.2	---	---	---	---
unknown mottled poacher	2.2	---	---	2.2	---	---	---	---
<u>Eptatretus</u> sp.	2.2	---	---	---	2.2	---	---	---
<u>Raja rhina</u>	2.2	---	---	---	---	---	---	2.2

SCHOOLING FISHES:

<u>Sebastes wilsoni</u>	937.9	290.3	55.8	591.8	---	---	---	---
<u>Sebastes</u> sp. (juvenile)	625.3	558.3	---	---	---	---	---	67.0

ALL FISHES:

Total density: 3155.4

Diversity indices: Richness (S) = 23 Evenness (J) = 0.44 Diversity (H') = 1.38

INVERTEBRATES: (81.9 % of videotape usable)

	Estimated density (#/hectare)
<u>Florometra serratissima</u>	2568.1
<u>Ophiacantha</u> sp.	2114.7
<u>Scypha/Iophon</u>	837.4
Pachastrellidae-like	140.7
<u>Allocentrotus fragilis</u>	67.0
<u>Henricia</u> sp.	55.8
<u>Parastichopus</u> spp.	35.7
<u>Mediaster aequalis</u>	31.3
<u>Pycnopodia helianthoides</u>	31.3
<u>Pteraster militaris</u>	29.0
Mycale-like	24.6
<u>Pteraster</u> spp.	15.6
<u>Luidia foliolata</u>	11.2
<u>Pycnopodia/Rathbunaster</u>	11.2
<u>Rathbunaster californicus</u>	6.7
<u>Stylasterias forreri</u>	4.5
Cerianthid anemone	2.2
<u>Crossaster papposus</u>	2.2
<u>Gorgonocephalus eucinemis</u>	2.2
<u>Solaster</u> sp.	2.2
<u>Stylasterias/Orthasterias</u>	2.2

Diversity indices: Richness (S) = 21 Evenness (J) = 0.46 Diversity (H') = 1.39

OTHER ORGANISMS PRESENT:

None

(Dive 89H4B continued)

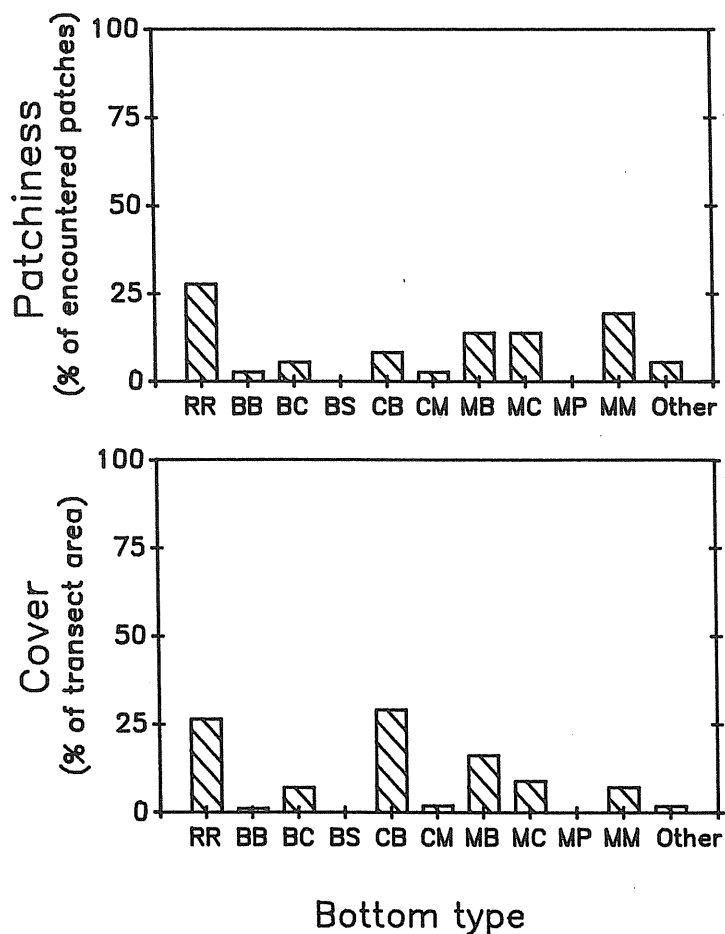
BOTTOM TYPE: (73% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
CB	Cobble + Boulder	29.0	8.3
RR	Rock Ridge	26.4	27.8
MB	Mud + Boulder	16.2	13.9
MC	Mud + Cobble	9.0	13.9
MM	Mud	7.2	19.4
BC	Boulder + Cobble	7.0	5.6
CM	Cobble + Mud	2.0	2.8
BM	Boulder + Mud	1.9	5.6
BB	Boulder	1.2	2.8

Richness (S) = 9

Patchiness: Evenness (J) = 0.89 Diversity (H') = 1.95

Cover: Evenness (J) = 0.82 Diversity (H') = 1.80



Dive Code: 1989 Heceta Bank, Station 5, Dive A (89H5A)

Delta Dive: 1521

Date: 9/06/89

Time: 1813-1915

Minimum Depth: 850 ft (259 m)

Maximum Depth: 1000 ft (305 m)

Remarks: Very strong current (0.5-1 Knotts)

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Microstomus pacificus</u>	134.4	---	---	16.1	64.5	34.9	18.8	---
<u>Lycodes cortezianus</u>	110.2	---	2.7	29.6	61.8	16.1	---	---
<u>Glyptocephalus zachirus</u>	80.6	2.7	2.7	45.7	26.9	2.7	---	---
<u>Anoplopoma fimbria</u>	29.6	---	---	---	---	10.7	16.1	2.7
<u>Sebastes diploproa</u>	18.8	---	2.7	10.7	5.4	---	---	---
<u>Sebastolobus alascanus</u>	16.1	---	2.7	13.4	---	---	---	---
<u>Raja kincaidii</u>	16.1	---	---	---	5.4	5.4	5.4	---
unknown mottled poacher	13.4	---	2.7	10.7	---	---	---	---
<u>Lyopsetta exilis</u>	8.1	---	---	8.1	---	---	---	---
<u>Eopsetta jordani</u>	8.1	---	---	5.4	2.7	---	---	---
<u>Eptatretus</u> sp.	8.1	---	---	5.4	---	---	2.7	---
<u>Psettichthys melanostictus</u>	5.4	---	---	5.4	---	---	---	---
<u>Raja rhina</u>	5.4	---	---	---	---	---	---	5.4
<u>Lycodes pacificus</u>	2.7	---	---	2.7	---	---	---	---
<u>Hydrolagus colliei</u>	2.7	---	---	---	2.7	---	---	---
<u>Merluccius productus</u>	2.7	---	---	---	---	2.7	---	---
<u>Raja</u> sp.	2.7	---	---	---	---	---	---	2.7

SCHOOLING FISHES:

None

ALL FISHES:

Total density: 464.9

Diversity indices: Richness (S) = 17 Evenness (J) = 0.73 Diversity (H') = 2.08

INVERTEBRATES: (98.1 % of videotape usable)

	Estimated density (#/hectare)
<u>Parastichopus</u> spp.	400.4
<u>Allocentrotus fragilis</u>	354.7
<u>Rathbunaster californicus</u>	196.2
<u>Mediaster aequalis</u>	53.7
<u>Neptunea</u> sp.	45.7
<u>Antiplanes</u> sp.	10.7
<u>Luidia foliolata</u>	10.7
<u>Neptunea</u> /Neptuneidae	10.7
<u>Octopus rubescens</u>	5.4
<u>Octopus</u> sp.	5.4
unidentified snail	5.4
<u>Lophaster/Asterias</u>	2.7

Diversity indices:

Richness (S) = 12

Evenness (J) = 0.62

Diversity (H') = 1.55

OTHER ORGANISMS PRESENT:

None

(Dive 89H5A continued)

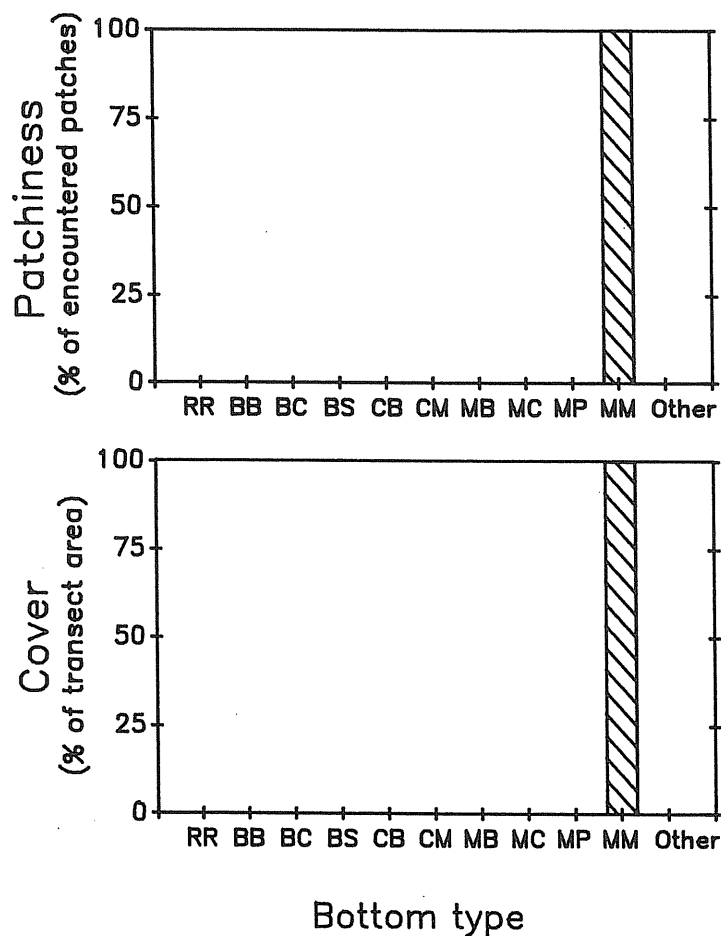
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
MM	Mud	100.0	100.0

Richness (S) = 1

Patchiness: Evenness (J) = 0 Diversity (H') = 0

Cover: Evenness (J) = 0 Diversity (H') = 0



Dive Code: 1989 Heceta Bank, Station 5, Dive B (89H5B)

Delta Dive: 1523

Date: 9/08/91

Time: 0726-0921

Minimum Depth: 550 ft (168 m)

Maximum Depth: 970 ft (296 m)

Remarks: Visibility 15 feet; mid-transect trawl marks

Estimated density (#/hectare) by total length

Scientific Name	Total	0 dm	1 dm	2 dm	3 dm	4 dm	5 dm	> 5 dm
NON-SCHOOLING FISHES:								
<u>Lycodes cortezi</u>	183.8	5.3	122.5	34.6	21.3	---	---	---
<u>Sebastes zacentrus</u>	157.2	---	5.3	114.6	37.3	---	---	---
unknown mottled poacher	133.2	---	48.0	85.3	---	---	---	---
<u>Microstomus pacificus</u>	101.2	---	---	10.7	37.3	53.3	---	---
<u>Agonus acipenserinus</u>	93.2	---	29.3	61.3	2.7	---	---	---
<u>Sebastes helvomaculatus</u>	71.9	---	21.3	48.0	2.7	---	---	---
<u>Glyptocephalus zachirus</u>	53.3	16.0	13.3	8.0	13.3	2.7	---	---
<u>Lyopsetta exilis</u>	50.6	5.3	13.3	29.3	2.7	---	---	---
<u>Sebastes diploproa</u>	45.3	10.7	24.0	8.0	2.7	---	---	---
<u>Anoplopoma fimbria</u>	45.3	---	---	---	---	29.3	13.3	2.7
<u>Atheresthes stomias</u>	37.3	---	10.7	21.3	---	---	2.7	2.7
<u>Hydrolagus colliei</u>	37.3	---	---	10.7	24.0	---	2.7	---
<u>Eptatretus</u> sp.	32.0	---	---	2.7	8.0	21.3	---	---
<u>Sebastes elongatus</u>	29.3	---	2.7	10.7	16.0	---	---	---
<u>Icelinus filamentosus</u>	24.0	---	21.3	---	2.7	---	---	---
unknown lanternfish	18.6	8.0	10.7	---	---	---	---	---
<u>Sebastolobus alascanus</u>	18.6	---	10.7	8.0	---	---	---	---
<u>Sebastes wilsoni</u>	13.3	---	10.7	2.7	---	---	---	---
<u>Icelinus</u> sp. (?)	13.3	---	8.0	---	5.3	---	---	---
<u>Sebastes</u> sp. (juvenile)	8.0	5.3	2.7	---	---	---	---	---
unknown fish	5.3	2.7	2.7	---	---	---	---	---
unknown small flatfish	5.3	---	2.7	2.7	---	---	---	---
<u>Raja kincaidii</u>	5.3	---	---	---	2.7	2.7	---	---
<u>Sebastes babcocki</u>	2.7	---	2.7	---	---	---	---	---
<u>Merluccius productus</u>	2.7	---	---	---	---	---	2.7	---
<u>Sebastes pinniger</u>	2.7	---	---	---	---	---	2.7	---

SCHOOLING FISHES:

unknown mottled poacher	2.7	---	---	2.7	---	---	---	---
-------------------------	-----	-----	-----	-----	-----	-----	-----	-----

ALL FISHES:

Total density: 1193.52

Diversity indices: Richness (S) = 26 Evenness (J) = 0.85 Diversity (H') = 2.76

INVERTEBRATES: (99.5 % of videotape usable)

	Estimated density (#/hectare)
<u>Allocentrotus fragilis</u>	1366.7
<u>Scypha/Iophon</u>	463.6
<u>Parastichopus</u> spp.	213.1
<u>Rathbunaster californicus</u>	205.1
<u>Pachastrellidae-like</u>	122.5
<u>Antiplanes</u> sp.	42.6
<u>Mediaster aequalis</u>	40.0
<u>Neptunea/Neptuneidae</u>	34.6
<u>Neptunea</u> sp.	26.6
pagurids	18.6
<u>Luidia foliolata</u>	10.7
<u>Octopus</u> sp.	10.7
<u>Lopholithodes foraminatus</u>	8.0
<u>Staurocalyptus-like</u>	8.0
<u>Aphrocallistes/Mycale</u>	5.3
<u>Hippasterias</u> spp.	5.3
white fennistrate sponge	5.3
<u>Henricia</u> spp.	2.7
<u>Octopus rubescens</u>	2.7
unidentified snail	2.7

Diversity indices: Richness (S) = 20 Evenness (J) = 0.54 Diversity (H') = 1.61

OTHER ORGANISMS PRESENT:

None

(Dive 89H5B continued)

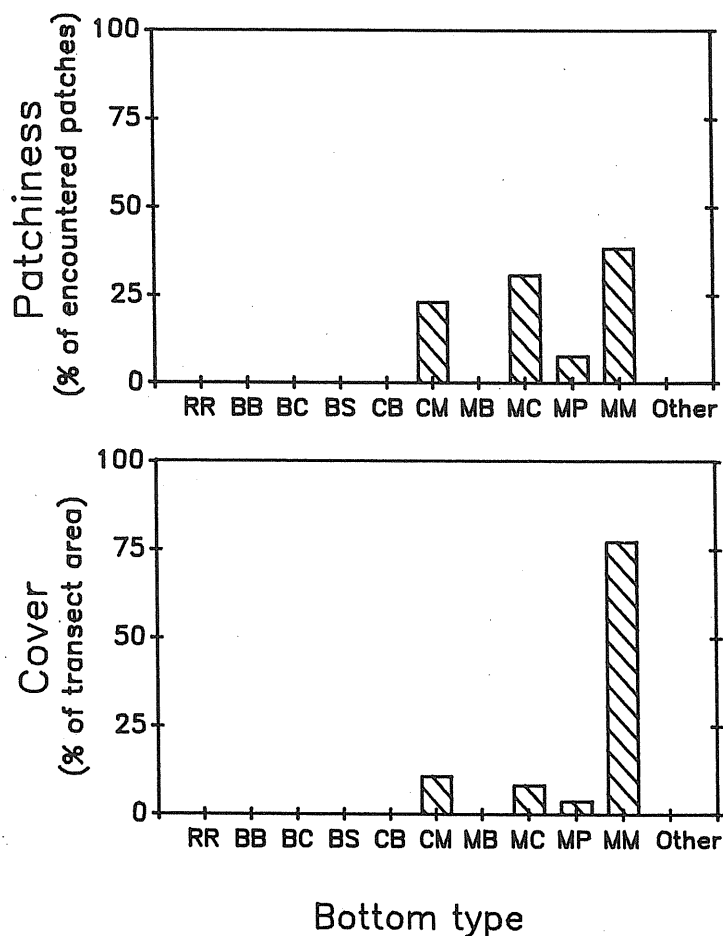
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
CB	Cobble + Boulder	27.1	20.0
RR	Rock Ridge	19.4	11.1
BC	Boulder + Cobble	18.6	17.8
TT	Pinnacles	9.3	4.4
CM	Cobble + Mud	8.1	11.1
MM	Mud	7.5	15.6
MC	Mud + Cobble	5.3	8.9
BM	Boulder + Mud	1.3	4.4
MB	Mud + Boulder	1.2	2.2
MP	Mud + Pebble	1.1	2.2
CC	Cobble	1.0	2.2

Richness (S) = 11

Patchiness: Evenness (J) = 0.90 Diversity (H') = 2.15

Cover: Evenness (J) = 0.82 Diversity (H') = 1.97



Dive Code: 1989 Heceta Bank, Station 6, Dive A (89H6A)

Delta Dive: 1518

Date: 9/04/89

Time: 1652-1809

Minimum Depth: 460 ft (140 m)

Maximum Depth: 950 ft (290 m)

Remarks: Poor visibility (5-15 feet); trawl marks during last half of transect

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes wilsoni</u>	862.1	14.4	89.1	752.9	5.7	---	---	---
<u>Sebastes alutus</u>	235.6	---	---	---	235.6	---	---	---
<u>Sebastes helvomaculatus</u>	137.9	2.9	28.7	74.7	31.6	---	---	---
<u>Sebastolobus alascanus</u>	100.6	8.6	46.0	37.4	8.6	---	---	---
<u>Agonus acipenserinus</u>	97.7	---	2.9	94.8	---	---	---	---
<u>Microstomus pacificus</u>	60.3	---	2.9	17.2	23.0	17.2	---	---
<u>Sebastes zacentrus</u>	51.7	---	2.9	28.7	20.1	---	---	---
<u>Icelinus filamentosus</u>	20.1	---	---	14.4	5.7	---	---	---
<u>Anoplopoma fimbria</u>	17.2	---	---	---	---	5.7	5.7	5.7
<u>Hydrolagus colliei</u>	14.4	---	---	---	2.9	2.9	8.6	---
<u>Lyopsetta exilis</u>	11.5	---	2.9	8.6	---	---	---	---
<u>Icelinus</u> sp. (?)	11.5	---	2.9	2.9	5.7	---	---	---
<u>Lycodes corteziianus</u>	8.6	---	8.6	---	---	---	---	---
unknown fish	8.6	---	2.9	5.7	---	---	---	---
<u>Ophiodon elongatus</u>	5.7	---	2.9	2.9	---	---	---	---
<u>Sebastes</u> sp. (juvenile)	5.7	---	---	---	---	---	5.7	---
<u>Oxylebius pictus</u>	2.9	---	---	2.9	---	---	---	---
<u>Sebastes elongatus</u>	2.9	---	---	2.9	---	---	---	---
unknown mottled poacher	2.9	---	---	2.9	---	---	---	---
<u>Hexagrammos decagrammus</u>	2.9	---	---	---	---	2.9	---	---

SCHOOLING FISHES:

<u>Sebastes alutus</u>	206.9	---	---	---	206.9	---	---	---
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ALL FISHES:

Total density: 1867.9

Diversity indices: Richness (S) = 18 Evenness (J) = 0.59 Diversity (H') = 1.69

INVERTEBRATES: (97.8 % of videotape usable)

	Estimated density (#/hectare)
<u>Allocentrotus fragilis</u>	9902.6
<u>Pachastrellidae-like</u>	4365.1
<u>Scypha/Iophon</u>	658.1
<u>Parastichopus</u> spp.	491.4
<u>Ophiacantha</u> sp.	413.8
<u>Rathbunaster californicus</u>	152.3
<u>Aphrocallistes/Mycale</u>	48.9
white fennistrate sponge	37.4
<u>Staurocalyptus-like</u>	34.5
<u>Mediaster aequalis</u>	31.6
<u>Henricia</u> spp.	20.1
<u>Florometra serratissima</u>	14.4
<u>Octopus rubescens</u>	11.5
<u>Neptunea</u> sp.	8.6
unidentified snail	8.6
<u>Pteraster</u> spp.	5.7
<u>Luidia foliolata</u>	2.9
<u>Metridium senile</u>	2.9
<u>Opisthoteuthis californica</u>	2.9

Diversity indices: Richness (S) = 19 Evenness (J) = 0.38 Diversity (H') = 1.12

OTHER ORGANISMS PRESENT:

None

(Dive 89H6A continued)

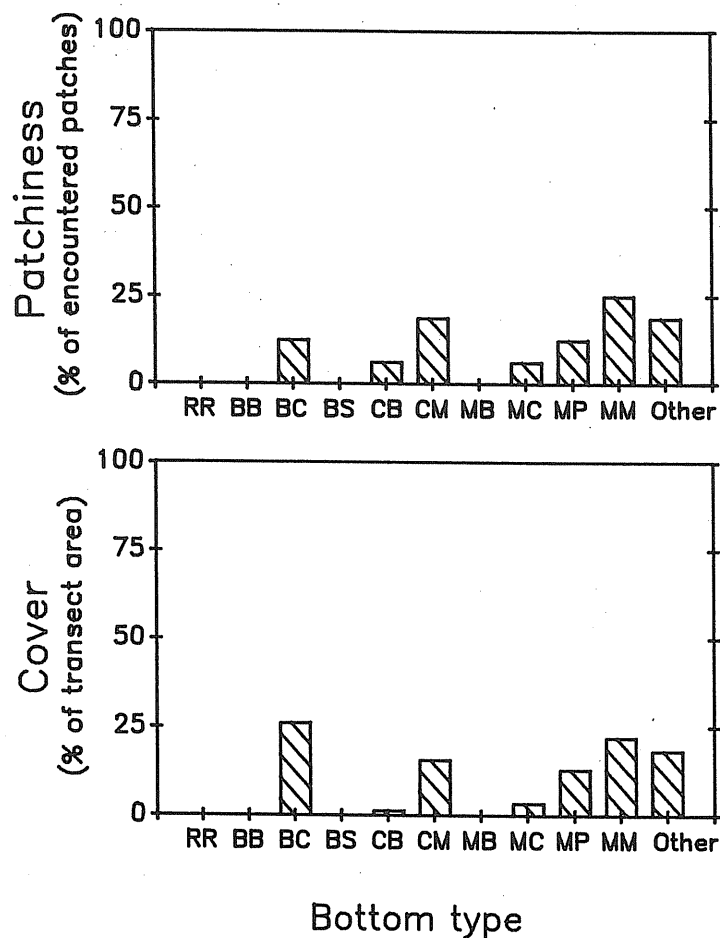
BOTTOM TYPE: (82% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
BC	Boulder + Cobble	26.0	12.5
MM	Mud	22.0	25.0
CC	Cobble	18.3	18.8
CM	Cobble + Mud	15.7	18.8
MP	Mud + Pebble	13.0	12.5
MC	Mud + Cobble	3.5	6.3
CB	Cobble + Boulder	1.4	6.3

Richness (S) = 7

Patchiness: Evenness (J) = 0.95 Diversity (H') = 1.84

Cover: Evenness (J) = 0.89 Diversity (H') = 1.73



Bottom type

Dive Code: 1989 Heceta Bank, Station 6, Dive B (89H6B)

Delta Dive: 1519

Date: 9/05/89

Time: 1407-1522

Minimum Depth: 460 ft (140 m)

Maximum Depth: 1160 ft (354 m)

Remarks: Visibility 15+ feet

Estimated density (#/hectare) by total length

<u>Scientific Name</u>	<u>Total</u>	<u>0 dm</u>	<u>1 dm</u>	<u>2 dm</u>	<u>3 dm</u>	<u>4 dm</u>	<u>5 dm</u>	<u>≥ 5 dm</u>
NON-SCHOOLING FISHES:								
<u>Sebastes wilsoni</u>	1968.2	---	1001.7	895.8	4.2	---	---	---
<u>Sebastes zacentrus</u>	376.2	---	31.2	245.2	97.7	2.1	---	---
<u>Sebastes helvomaculatus</u>	241.1	---	39.5	170.4	31.2	---	---	---
<u>Sebastolobus alascanus</u>	114.3	---	45.7	37.4	27.0	4.2	---	---
<u>Anoplopoma fimbria</u>	89.4	---	---	---	---	---	6.2	83.1
<u>Agonus acipenserinus</u>	70.7	---	12.5	58.2	---	---	---	---
<u>Microstomus pacificus</u>	54.0	---	---	4.2	24.9	24.9	---	---
<u>Hydrolagus colliei</u>	47.8	---	---	---	---	6.2	39.5	2.1
<u>Sebastes</u> sp. (juvenile)	29.1	---	---	---	---	---	---	---
<u>Lycodes cortezianus</u>	20.8	---	---	2.1	8.3	10.4	---	---
<u>Sebastes diploproa</u>	16.6	---	---	---	8.3	4.2	4.2	---
<u>Sebastes elongatus</u>	14.5	---	---	10.4	4.2	---	---	---
<u>Lyopsetta exilis</u>	14.5	---	---	10.4	2.1	2.1	---	---
<u>Rathbunella</u> sp.	8.3	---	8.3	---	---	---	---	---
<u>Radulinus asprellus</u>	8.3	---	6.2	2.1	---	---	---	---
<u>Eptatretus</u> sp.	8.3	---	---	---	4.2	4.2	---	---
<u>Raja</u> sp.	6.2	---	---	---	2.1	---	2.1	2.1
<u>Icelinus filamentosus</u>	4.2	---	---	4.2	---	---	---	---
<u>Sebastes entomelas</u>	4.2	---	---	---	---	2.1	---	2.1
<u>Sebastes babcocki</u>	2.1	---	---	2.1	---	---	---	---
<u>Sebastes nigrocinctus</u>	2.1	---	---	---	2.1	---	---	---
<u>Sebastes pinniger</u>	2.1	---	---	---	---	2.1	---	---
<u>Atheresthes stomias</u>	2.1	---	---	---	---	---	2.1	---
<u>Raja binoculata</u>	2.1	---	---	---	---	---	---	2.1

SCHOOLING FISHES:

<u>Sebastes zacentrus</u>	415.7	---	---	---	415.7	---	---	---
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ALL FISHES:

Total density: 3522.7

Diversity indices: Richness (S) = 23 Evenness (J) = 0.46 Diversity (H') = 1.45

INVERTEBRATES: (99.3 % of videotape usable)

	Estimated density (#/hectare)
<u>Allocentrotus fragilis</u>	5264.4
Pachastrellidae-like	4811.3
<u>Scypha/Iophon</u>	592.3
<u>Parastichopus</u> spp.	503.0
<u>Rathbunaster californicus</u>	189.1
<u>Aphrocallistes/Mycale</u>	97.7
<u>Florometra serratissima</u>	49.9
<u>Henricia</u> spp.	41.6
<u>Staurocalyptus</u> -like	14.5
<u>Lopholithodes foraminatus</u>	6.2
<u>Tritonia</u> sp.	4.2
unidentified snail	4.2
<u>Hippasterias</u> spp.	2.1
<u>Luidia foliolata</u>	2.1
<u>Mediaster aequalis</u>	2.1
<u>Octopus</u> sp.	2.1
<u>Opisthoteuthis californica</u>	2.1
<u>Rossia pacifica</u>	2.1

Diversity indices: Richness (S) = 18 Evenness (J) = 0.41 Diversity (H') = 1.19

OTHER ORGANISMS PRESENT:

None

(Dive 89H6B continued)

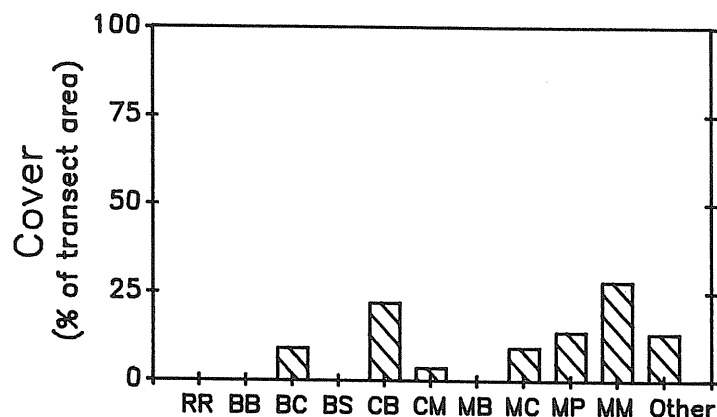
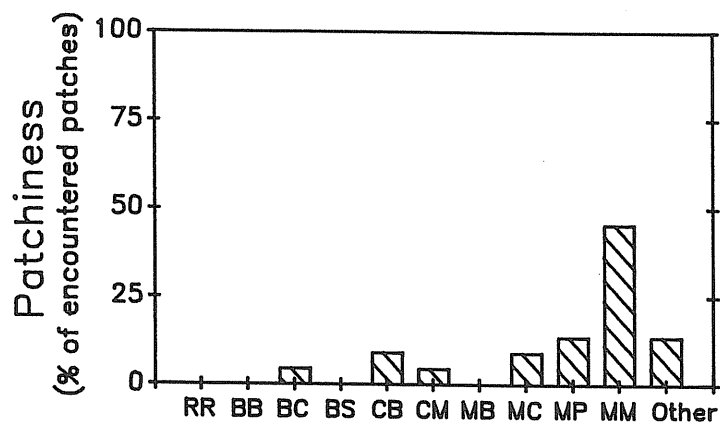
BOTTOM TYPE: (100% of videotape usable)

<u>Code</u>	<u>Description</u>	<u>% Cover</u>	<u>% Patchiness</u>
MM	Mud	28.1	45.5
CB	Cobble + Boulder	22.1	9.1
MP	Mud + Pebble	14.0	13.6
CC	Cobble	13.4	9.1
MC	Mud + Cobble	9.5	9.1
BC	Boulder + Cobble	9.3	4.5
CM	Cobble + Mud	3.7	4.5
CP	Cobble + Pebble	0.0	4.5

Richness (S) = 7

Patchiness: Evenness (J) = 0.82 Diversity (H') = 1.71

Cover: Evenness (J) = 0.92 Diversity (H') = 1.80



Bottom type