



A REPORT ON
TASK 6: GRAPHICAL DATA ANALYSIS
FOR THE 2007 IMPLEMENTATION OF THE
SARASOTA TIDAL CREEK CONDITION INDEX

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Purchase Order No. P737068

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Mote Marine Laboratory Technical Report No. 1191



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LETTER REPORT

SARASOTA COUNTY TIDAL CREEK CONDITION INDEX

PHASE 4 (2007): TASK 6

BACKGROUND

The importance of tidal creeks, including their headwater areas and the narrow reaches of coastal rivers, cannot be overstated. They are valuable environmental resources in that they are unique ecosystems that function as a link between uplands and estuaries. While comparative ecological health assessment indices have been developed for marine, estuarine, and freshwater ecosystems, none has been developed for tidal creeks using rapid survey techniques. Sarasota County and Mote Marine Laboratory have collaborated to develop biological indicators for tidal creeks. The preliminary effort to develop a Tidal Creek Condition Index for County tidal creeks by Mote Marine Laboratory was divided into three phases.

During the first phase of the project in 2004, County staff conducted research to collect existing data for the sub-basins of the 20 tidal creeks. The data were compared to establish the ecological condition of those streams, characterize the condition of their sub-basins, and select 2 streams that could be deemed as opposites (best and worst) by the condition of their respective sub-basins. Phase I resulted in a preliminary rough grading of 16 coastal watersheds and streams in order of best condition to worst condition, and concluded that there were enough streams with very different major basin features to be able to move forward with the next phase of the project.

During the second phase in 2005, Mote Marine Laboratory conducted field studies to characterize extremes among County coastal systems to determine the range of ecological conditions available for index development. The assessment resulted in two reports: "The Gottfried Creek Reconnaissance Report", July 12, 2005 and "The Whitaker Bayou Reconnaissance Report", August 17, 2005 and concluded that there were a sufficient number of county systems to develop a biologically based stream condition index.

During the third phase in 2006, Mote Marine Laboratory developed and tested a prototypic creek index based on ecological attributes that could be measured using rapid survey techniques. The test was made in 15 County coastal creek systems. A report, "Biological Condition Index for Tidal Streams in Coastal Sarasota County, Florida," providing methods and results of the test and a recapitulation of previous planning efforts, was submitted on September 30, 2006. Details of Phase III conclusions and recommendations appear in the July 23, 2007 "Report on Preparatory Tasks 1-4 for the 2007 Implementation of the Sarasota Tidal Creek Condition Index."

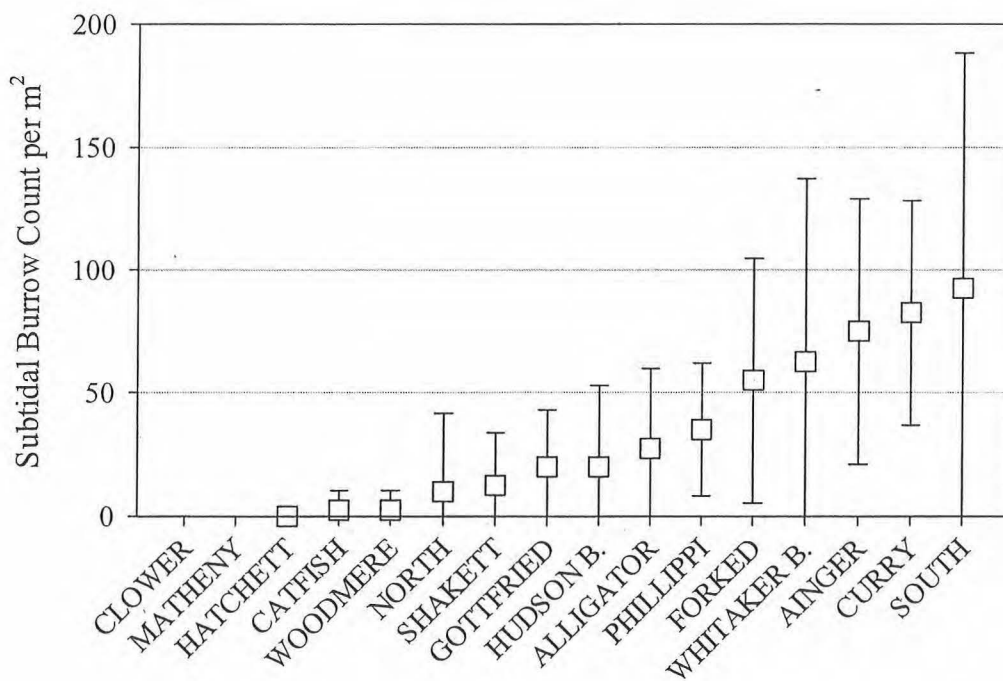
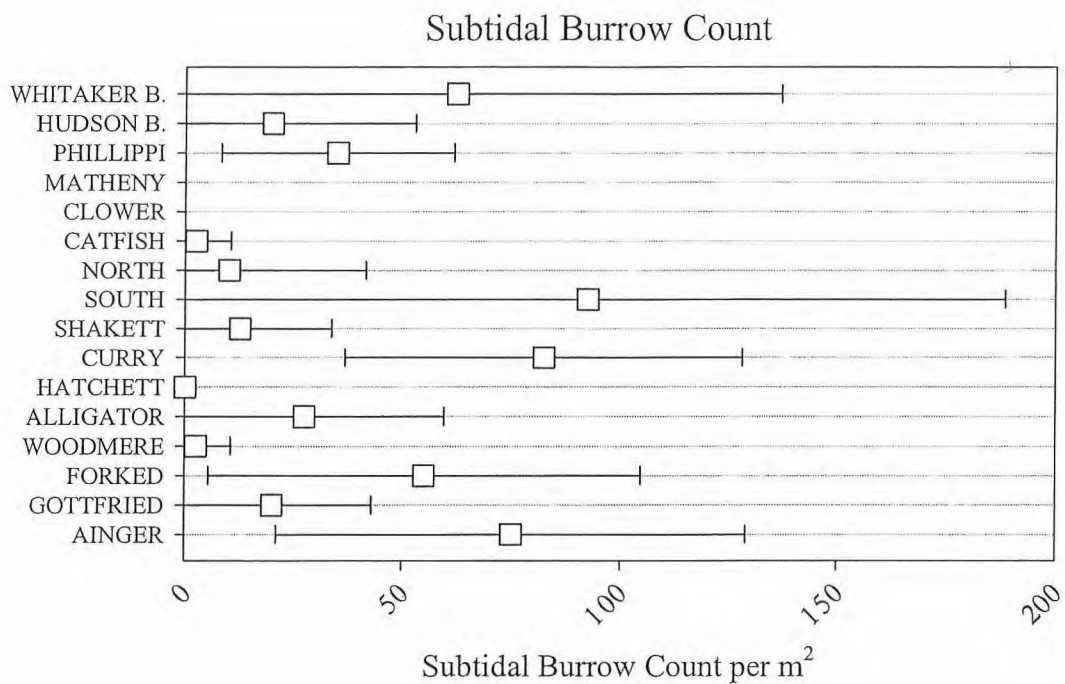


Figure 1. Subtidal burrow counts for Sarasota County creeks. Upper panel presents data by creek from north to south; lower panel presents data sorted by mean values from lowest to highest values. Data for all creeks and parameters appear in Appendix 4.

DISCUSSION

Sites selected for the 2007 field effort were largely the same as those employed in 2006. Some sites were occupied for the first time in 2007. Hudson Bayou, Matheny Creek, and Clower Creek were sampled exclusively within the creek compared to 2006 when some data were collected near their mouths. This resulted in fewer data being collected because of limited resource availability and the need to employ safe practices. Hatchett Creek was sampled for the first time and its primary site appeared satisfactory. Woodmere Creek was also sampled but close by its mouth owing to the geography of the area and resource availability. Some influence of Lemon Bay may exist as a result. A different site was also used in Ainger Creek to avoid bridge, channel, and boat vessel effects and experience in the field was satisfactory.

An average time on-station of two hours was reasonable for rapid-survey purposes, especially when trying to visit two nearby creeks per day because transit times can be considerable especially in slow-speed zones. Weather had a strong effect on station times. Although transparency in a majority of creeks was favorable for sampling and measurement, overcast and windy conditions reduced visibility considerably and required full immersion for visual surveys. On balance, more parameters and strata were sampled in 2007 than are likely needed once data-analysis is conducted, and to such extent as the effort is reduced a corresponding efficiency may be expected.

Standard procedures and the Version 7 field sheets were satisfactory in all creeks where surveyors could work in the water. In practice, some efficiencies were achieved by collecting data in a slightly different order, for example by nesting samples for *Tagelus*, other mollusks, and benthic infauna, and these improvements can be added to standard procedures.

Data completeness was affected by the absence or limited availability of a stratum (intertidal zone, for example) or resource (SAV bed) in creeks. Data completeness was also affected by the necessity of using alternative sampling methods, or forgoing an effort, in unsanitary streams. The possibility of combining intertidal and subtidal data for a creek is under consideration as the project moves into the next and final phase, but some improvements to data completeness can already be achieved for certain metrics.

Net catch data, for example, have intentionally been kept in discrete form with catches of fish, crabs, shrimp, and other biota from the same net tow being treated as individual data fields. It is possible to combine these catches with a modest improvement in data completeness, as illustrated by the final seven figures in Appendix 4. In the same manner, the effect of combining *Tagelus* data with Other Mollusk data is being evaluated.

Finally, three parameters related to oysters were extracted from Sarasota County Government's 2007 Oyster Monitoring Program. Oyster data were collected from ten creeks by county staff during the same period of time that Condition Index data were

38	TUNICATE PERCENT COVER	10	98.36
39	DRIFT EXTENT	9	98.70
40	FILAM EXTENT	9	99.03
41	SAV EXTENT	9	99.37
42	OYSTER EXTENT	8	99.66
43	SAV SPECIES NUMBER	7	99.93
44	FUNGUS EXTENT	1	99.96
45	TUNICATE EXTENT COVER	1	100.00
46	LIVE TAG COHORT NO.	0	100.00
47	OYSTER HT.	0	100.00
48	OYSTER SPAT	0	100.00
49	OYSTERS %	0	100.00

APPENDIX 3.

Number of biological data and cumulative percent of intertidal plus subtidal data by parameter for the 2007 Tidal Creek Condition Index.

Intertidal plus Subtidal Records

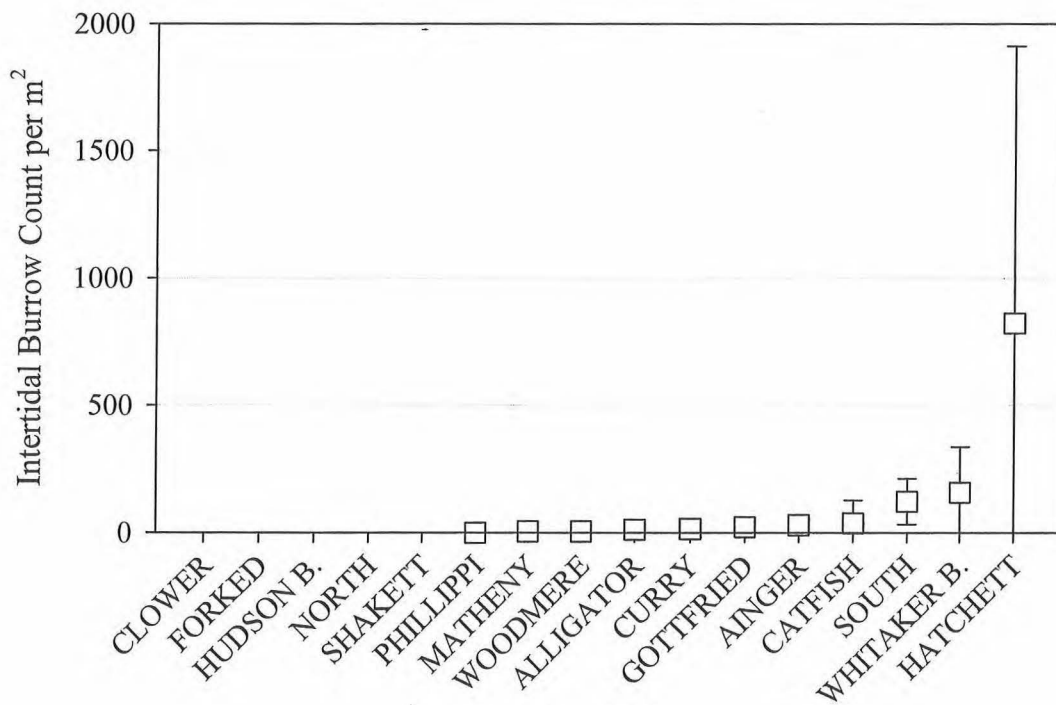
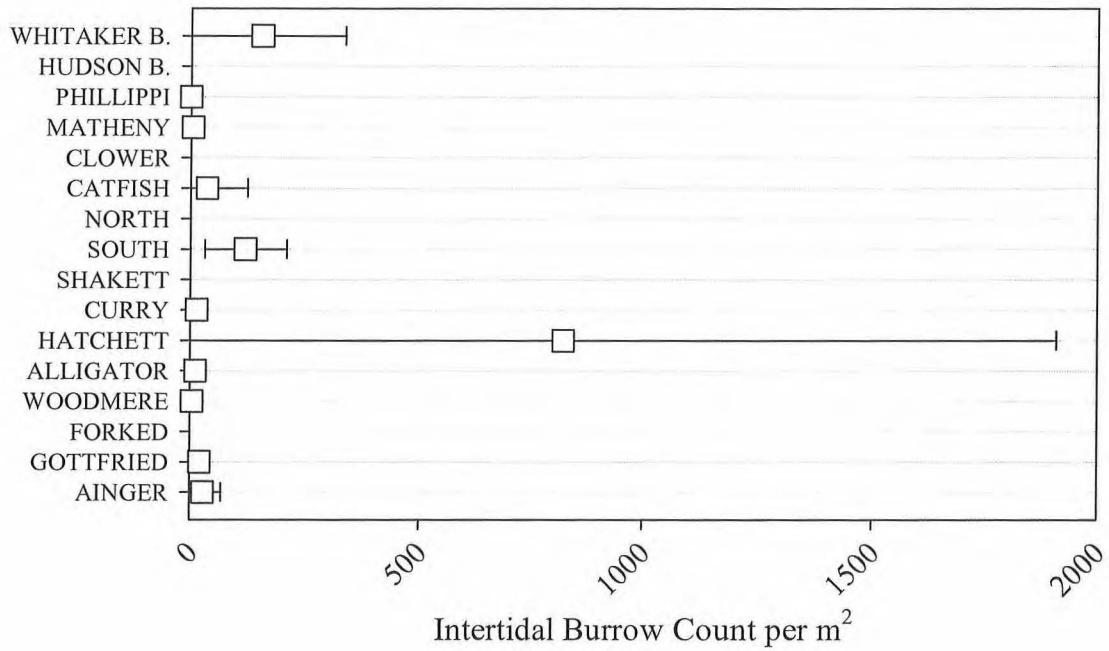
Parameter	Count	Cumulative Percent
1 BURROW COUNT	250	5.65
2 DEAD TAG COHORT NO	238	11.03
3 LIVE TAG COUNT	238	16.41
4 DEAD TAG COUNT	236	21.74
5 PERI PERCENT COVER	220	26.71
6 TAG PERCENT COVER	220	31.68
7 OTHER LIVE MOLL COUNT	208	36.38
8 DRIFT PERCENT COVER	199	40.88
9 BARE NET CRAB	180	44.95
10 BARE NET FISH	180	49.02
11 BARE NET SHRIMP	180	53.08
12 SAV PERCENT COVER	180	57.15
13 BARE NET OTHER	179	61.20
14 OYSTER PERCENT COVER	170	65.04
15 FILAM PERCENT COVER	160	68.66
16 LIVE COHORT NO.	138	71.77
17 DRIFT NET CRAB	97	73.97
18 DRIFT NET FISH	97	76.16
19 DRIFT NET OTHER	97	78.35
20 DRIFT NET SHRIMP	97	80.54
21 LIVE TAG COHORT NO.	90	82.58
22 PERI NET CRAB	70	84.16
23 PERI NET FISH	70	85.74
24 PERI NET OTHER	70	87.32
25 PERI NET SHRIMP	70	88.90
26 SAV EPI COVER	60	90.26
27 SAV EPI LUX	60	91.62
28 SAV NET CRAB	35	92.41
29 SAV NET FISH	35	93.20
30 SAV NET OTHER	35	93.99
31 SAV NET SHRIMP	35	94.78
32 TAG EXTENT	31	95.48
33 PERI EXTENT	22	95.98
34 DRIFT EXTENT	19	96.41
35 SAV EXTENT	18	96.81

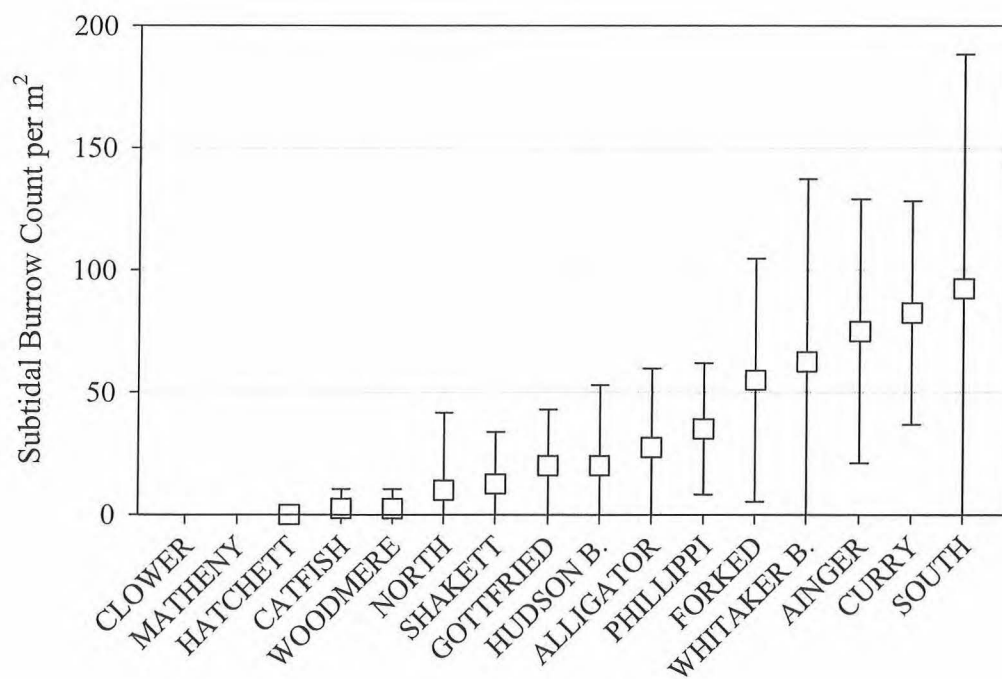
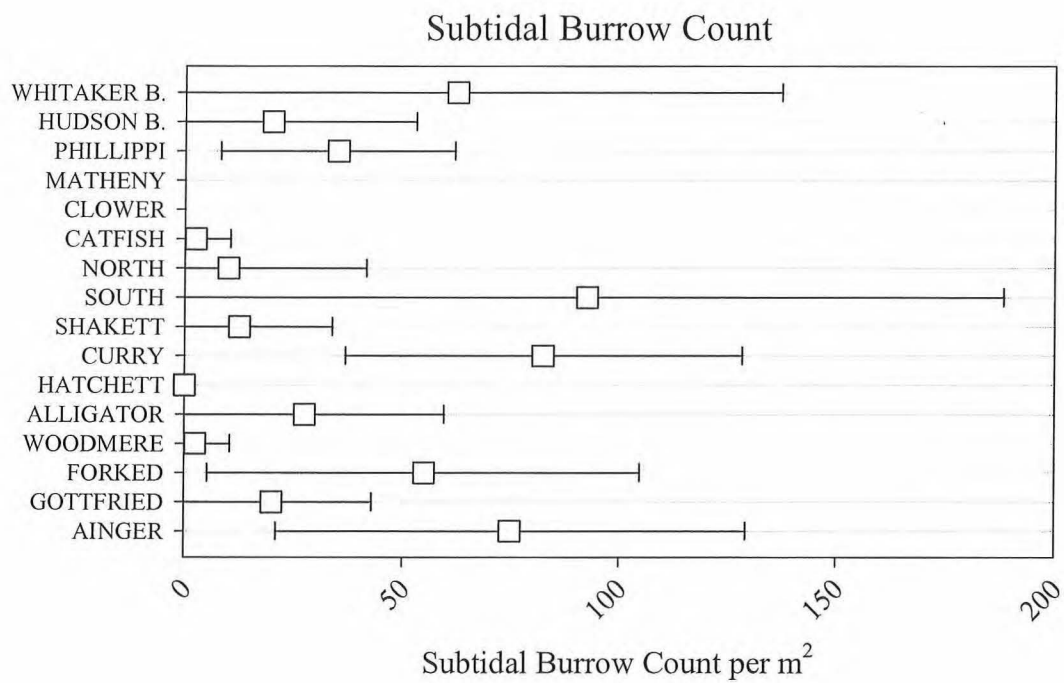
36 OYSTER EXTENT	17	97.20
37 FILAM EXTENT	16	97.56
38 SAV SPECIES NUMBER	14	97.88
39 OYSTER SPAT	11	98.12
40 OYSTERS %	11	98.37
41 FILAM NET CRAB	10	98.60
42 FILAM NET FISH	10	98.82
43 FILAM NET OTHER	10	99.05
44 FILAM NET SHRIMP	10	99.28
45 FUNGUS PERCENT COVER	10	99.50
46 OYSTER HT.	10	99.73
47 TUNICATE PERCENT COVER	10	99.95
48 FUNGUS EXTENT	1	99.98
49 TUNICATE EXTENT COVER	1	100.00

APPENDIX 4.

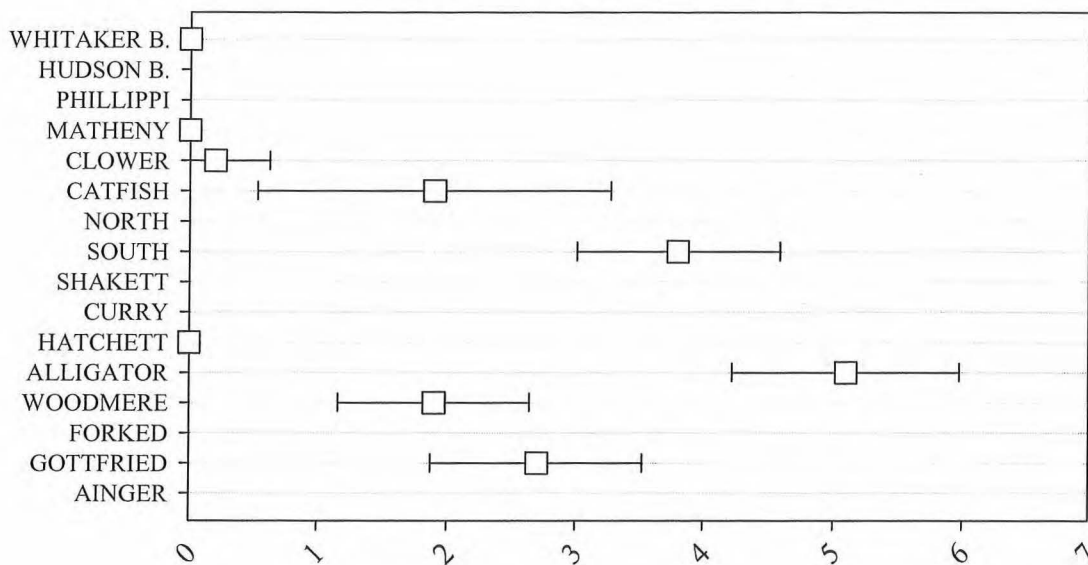
Graphical presentations of biological data collected in the 2007 Sarasota County Tidal Creek Condition Index effort. Data are presented by parameter in descending order from Appendix 3. Parameters are presented first for intertidal data and next by subtidal data. Each data set is depicted in two formats. An upper panel presents data by creek from north (Whitaker Bayou) to south (Ainger Creek). A lower panel presents the same data where creeks have been sorted from lowest to highest mean values.

Intertidal Burrow Count

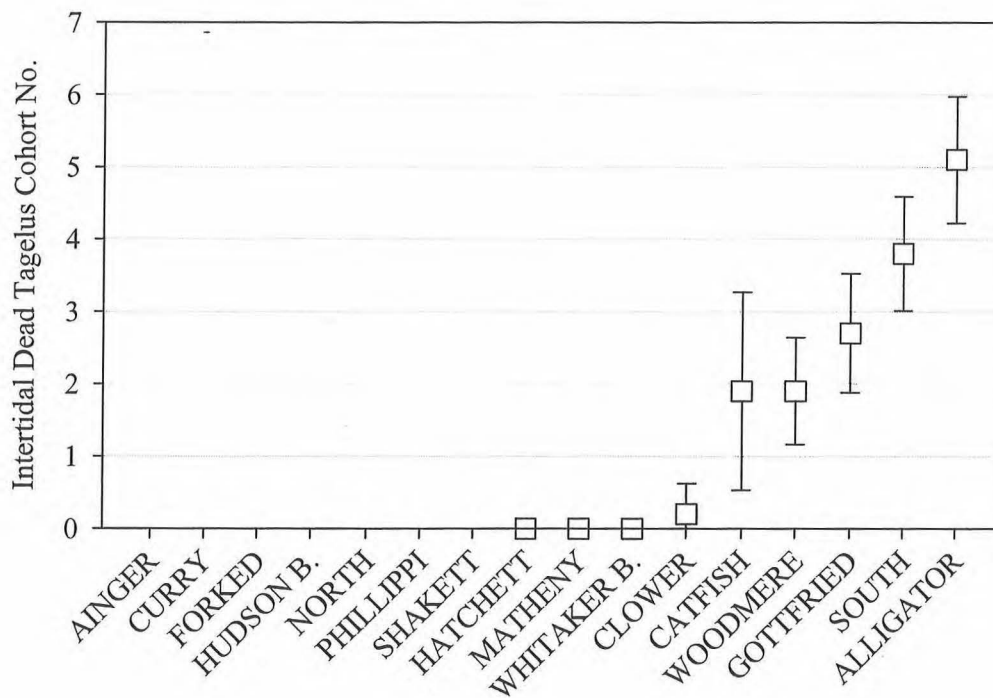




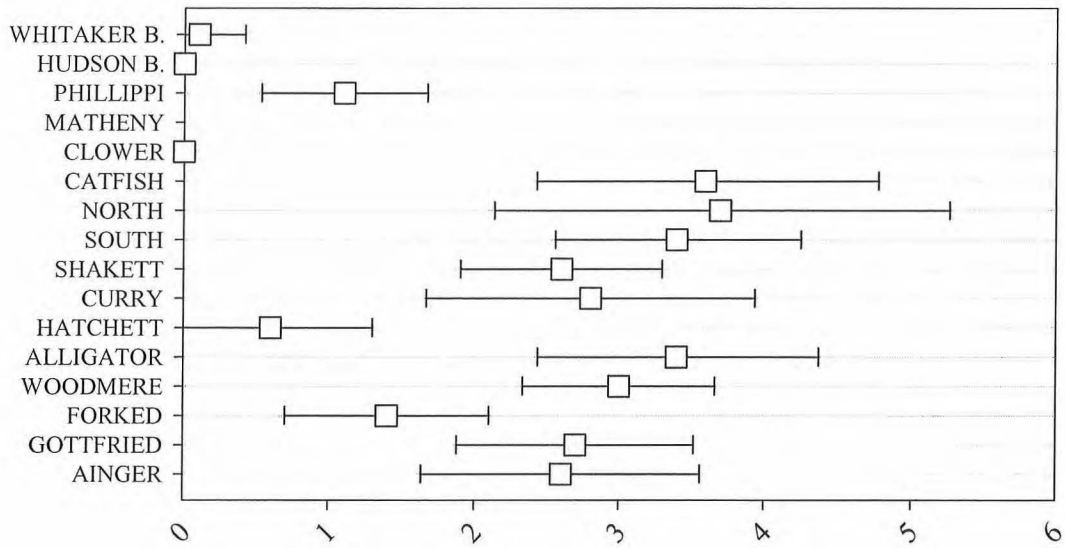
Intertidal Dead Tagelus Cohort No.



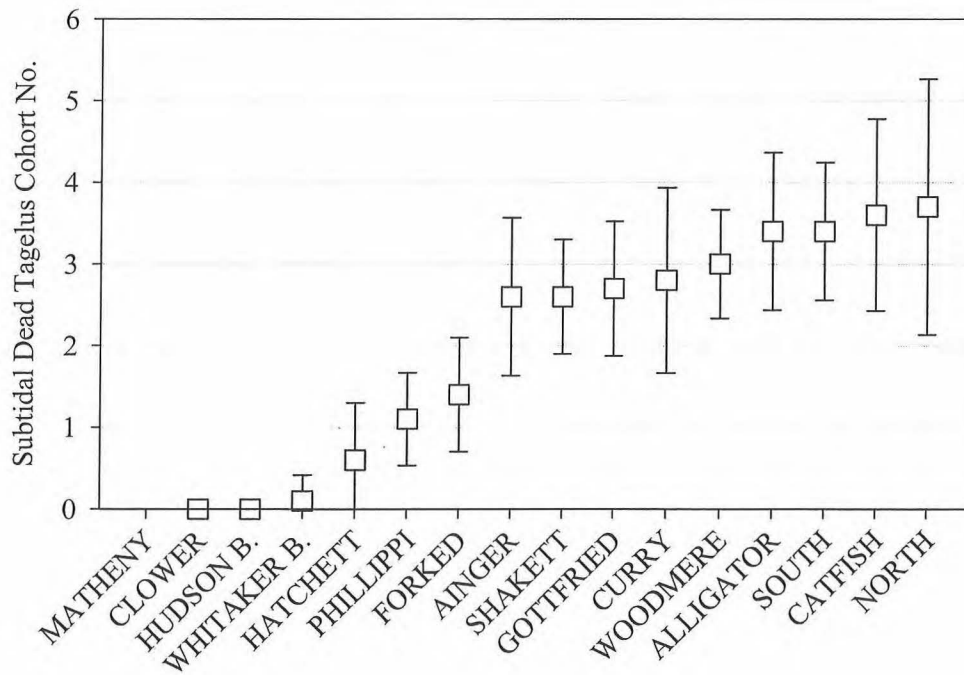
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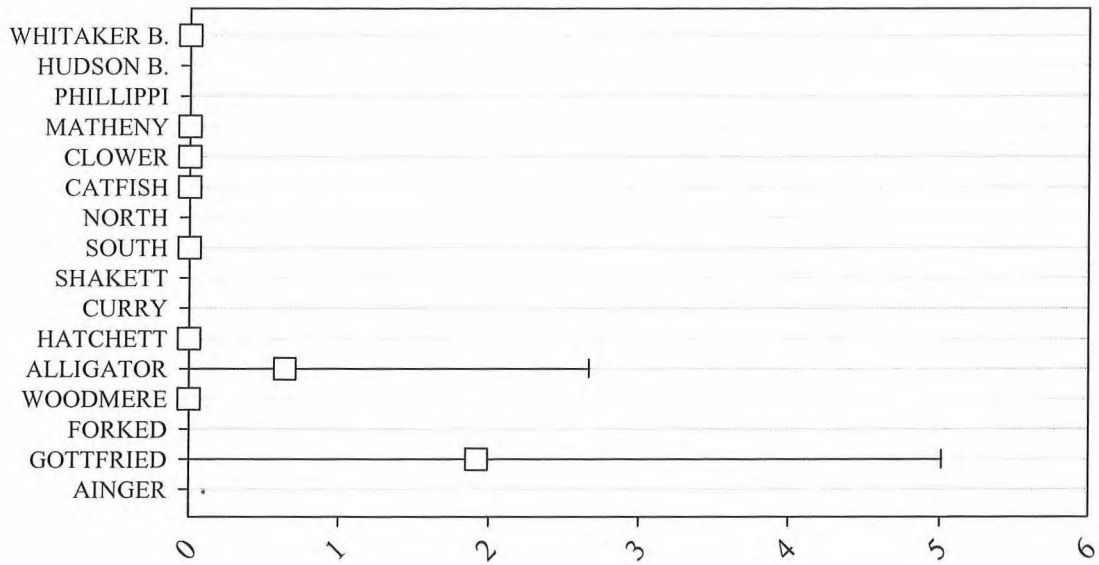
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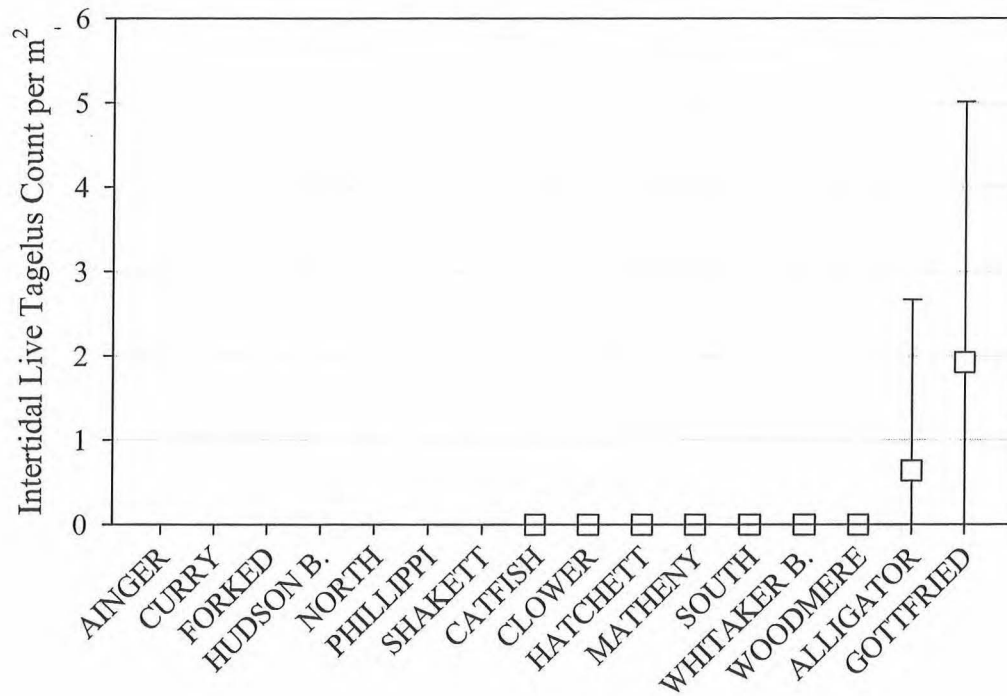
Subtidal Dead Tagelus Cohort No.



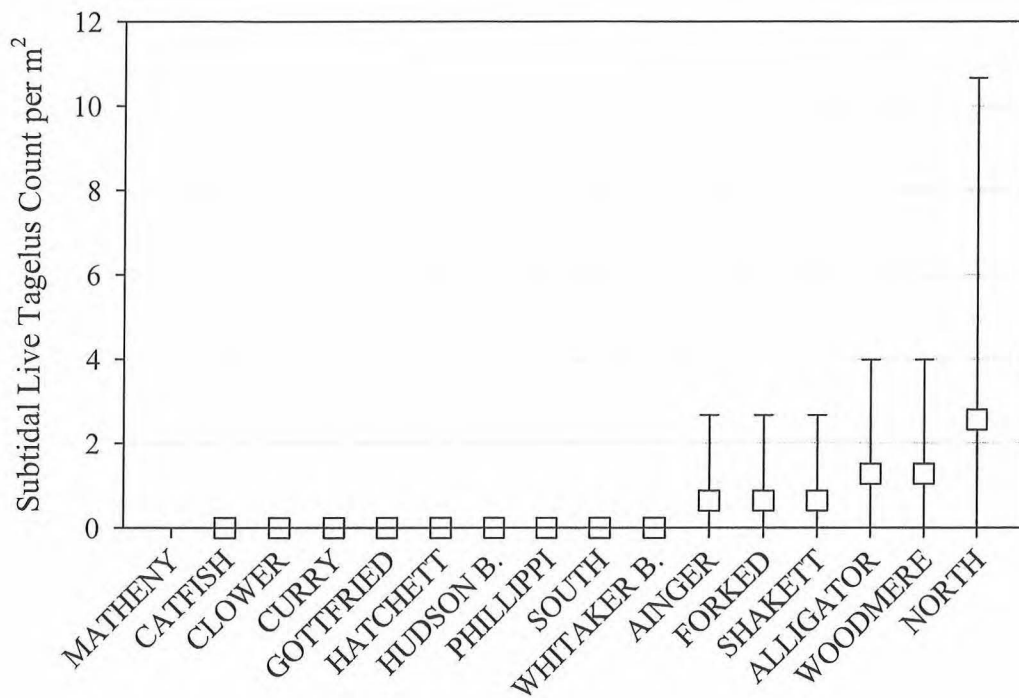
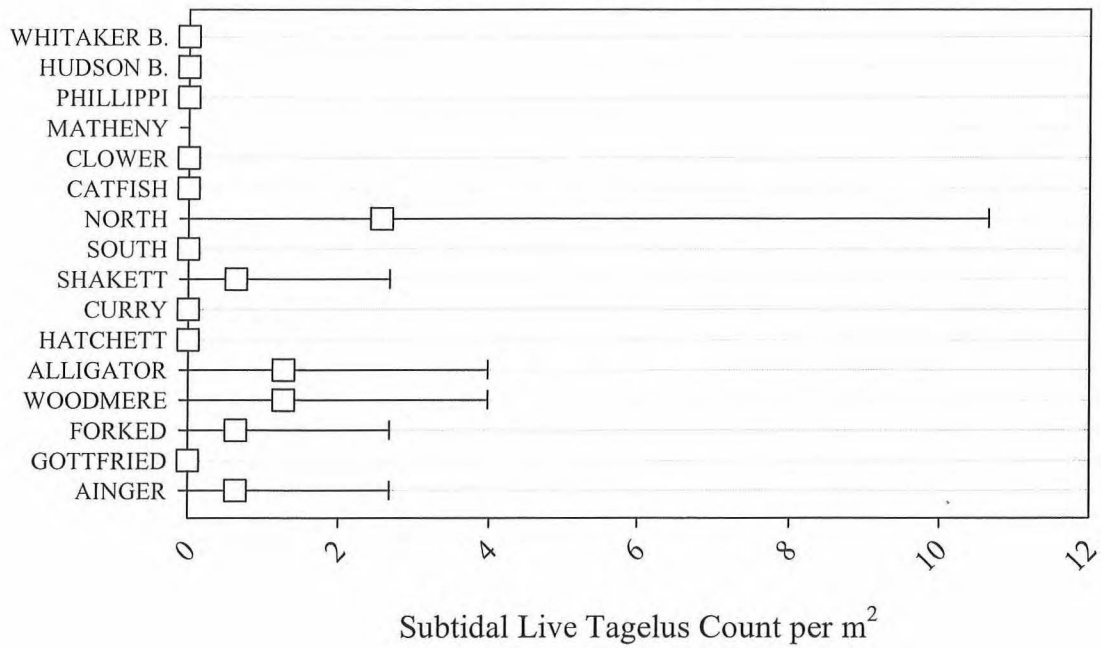
Intertidal Live Tagelus Count



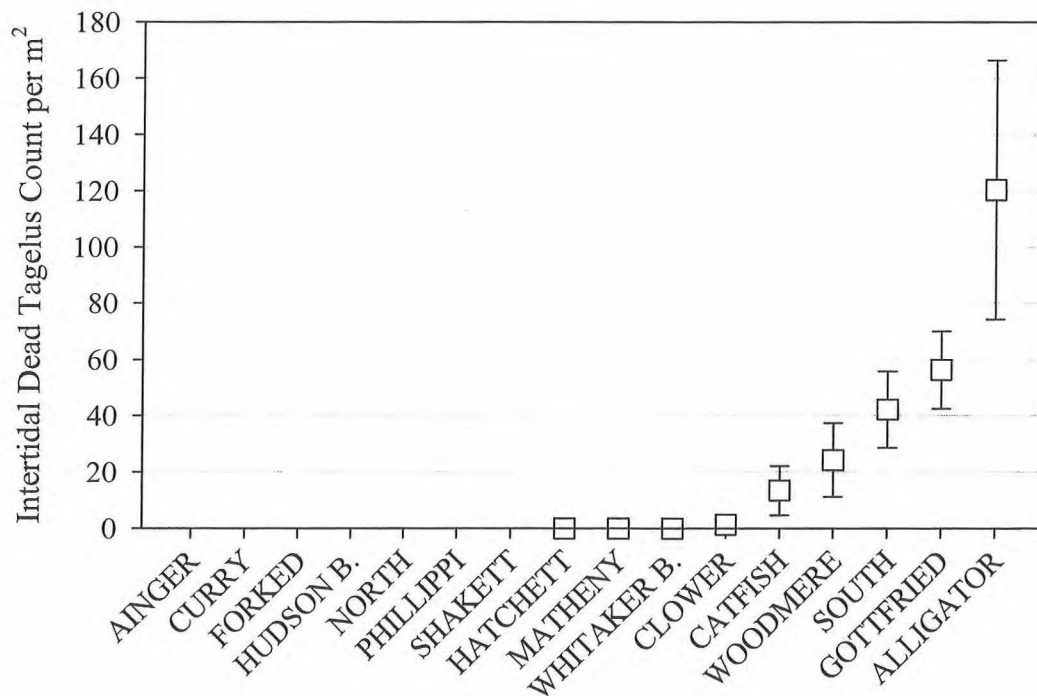
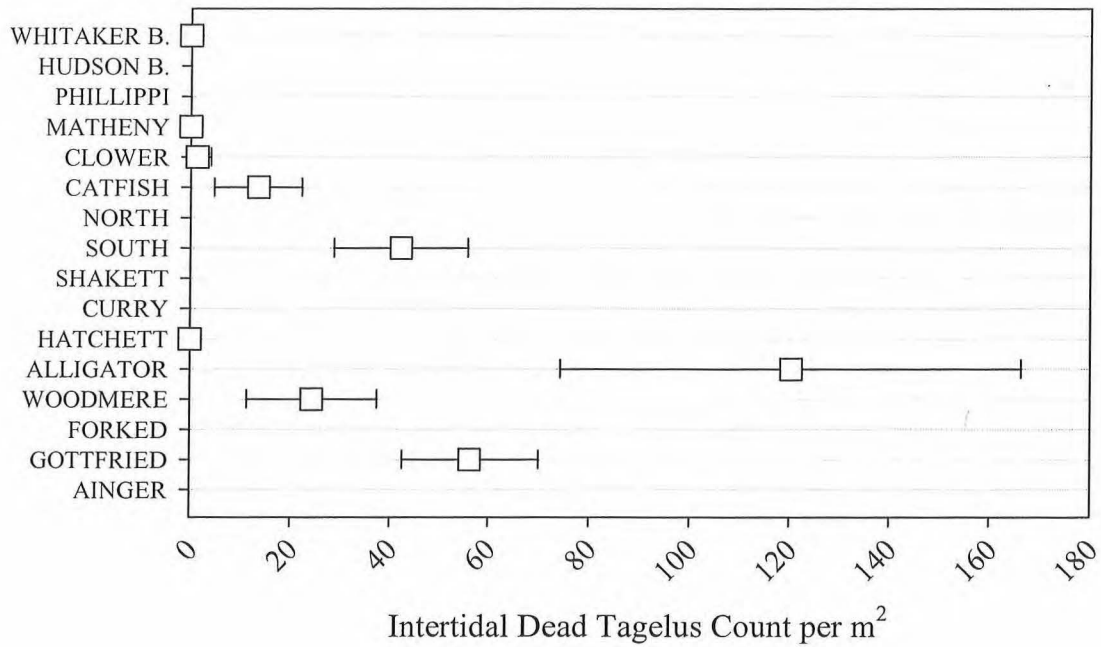
Intertidal Live Tagelus Count per m²



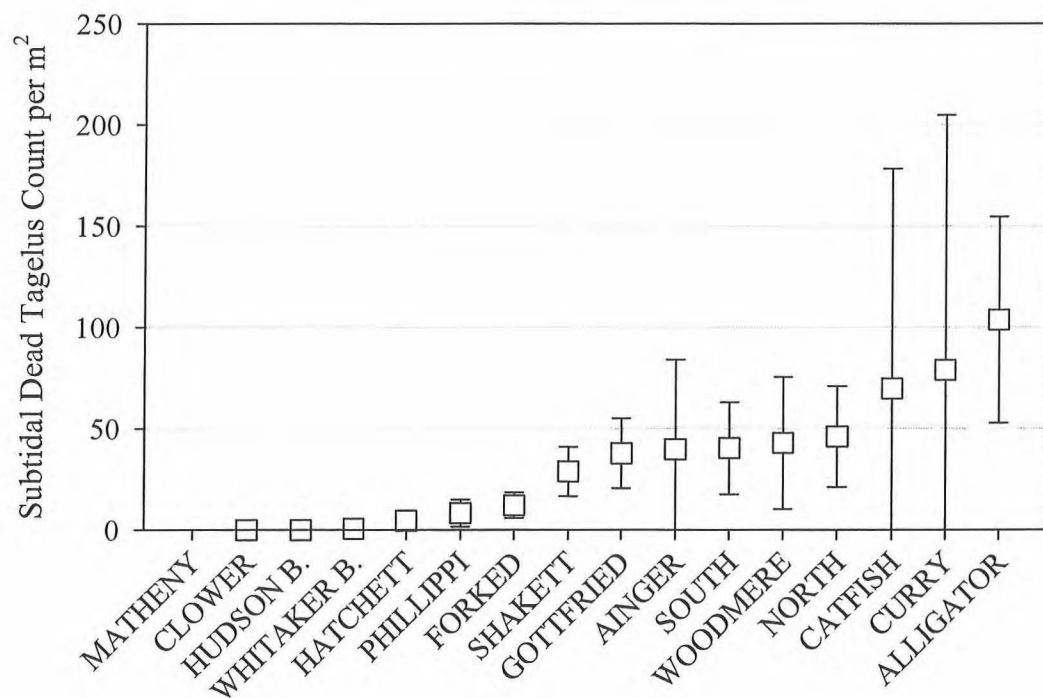
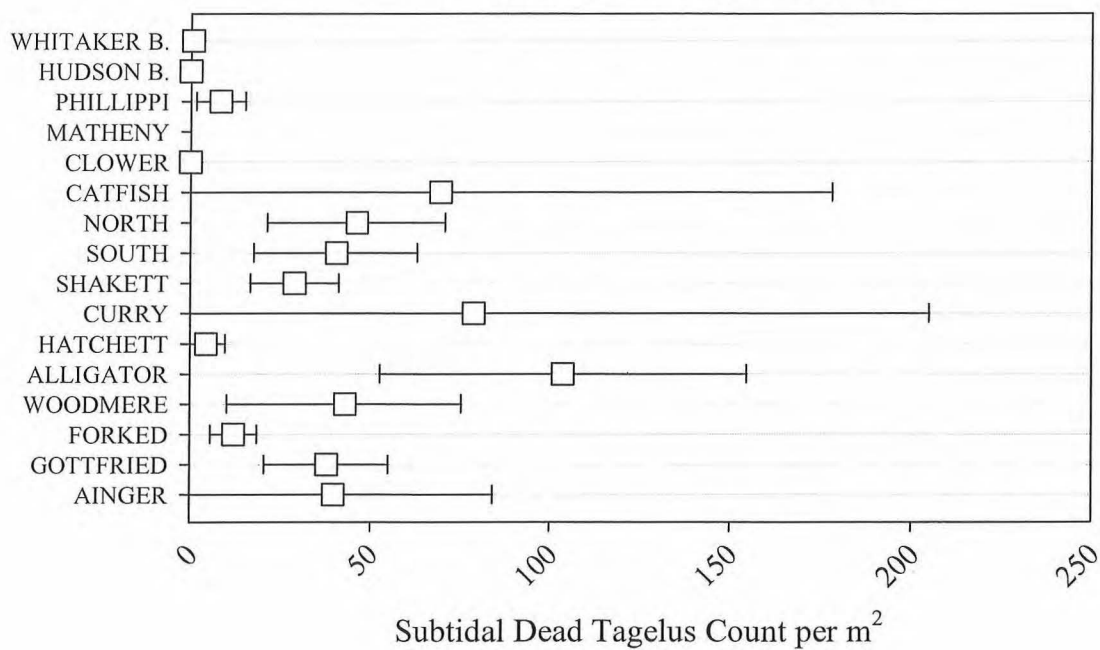
Subtidal Live Tagelus Count



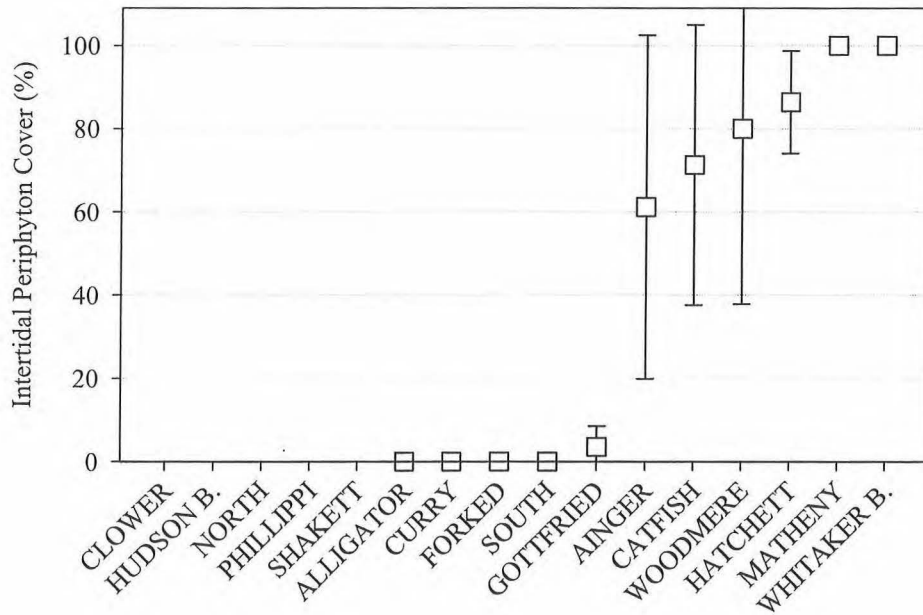
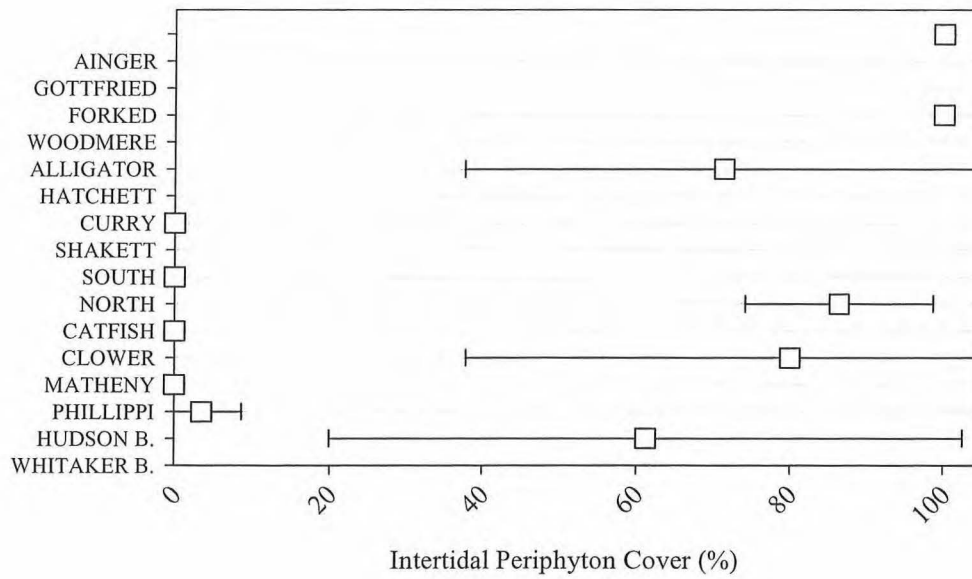
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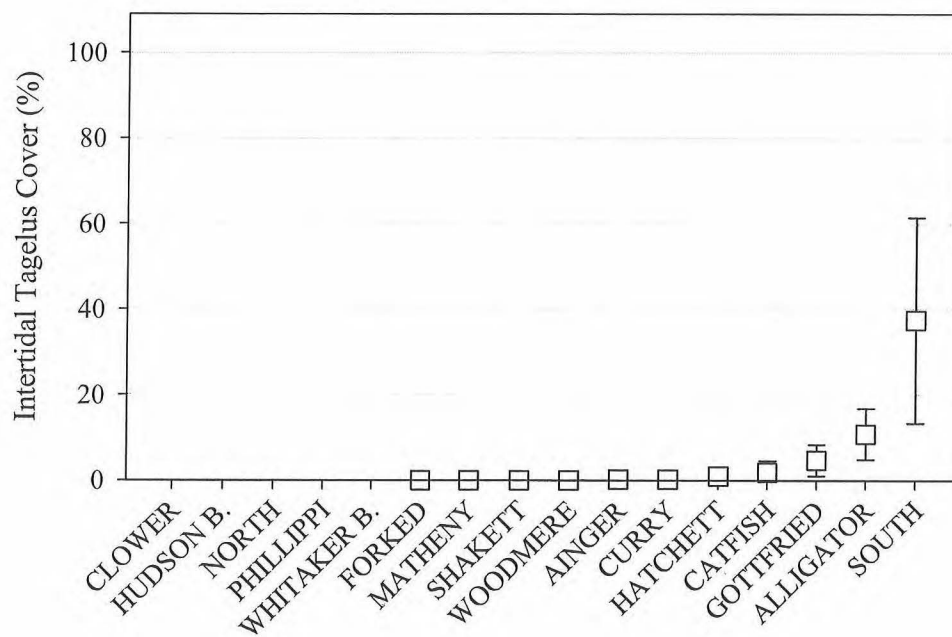
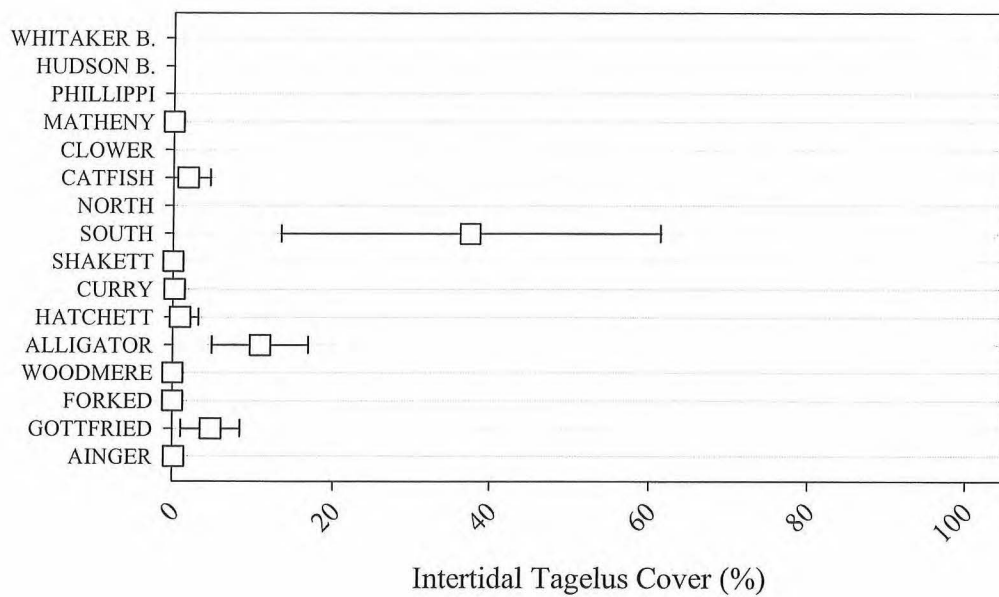
Subtidal Dead Tagelus Count



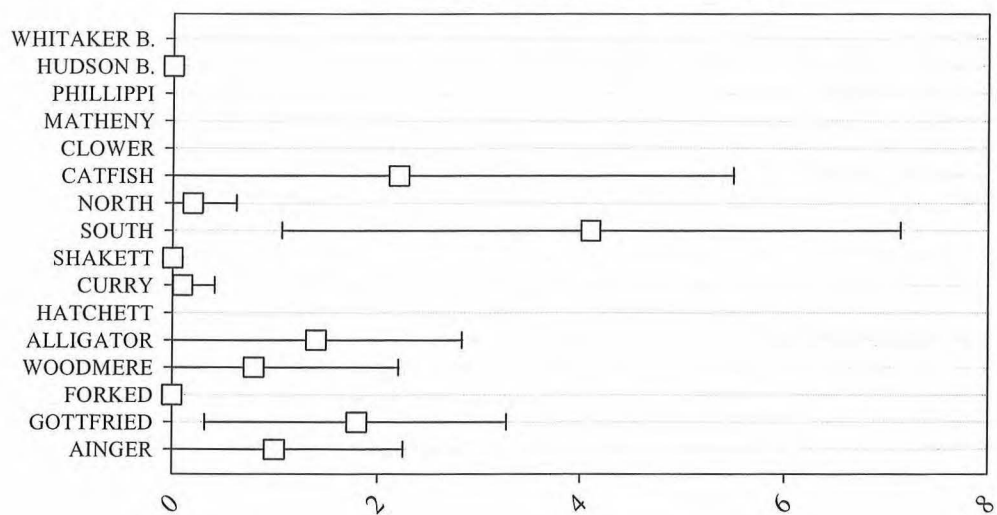
Intertidal Periphyton Cover (%)



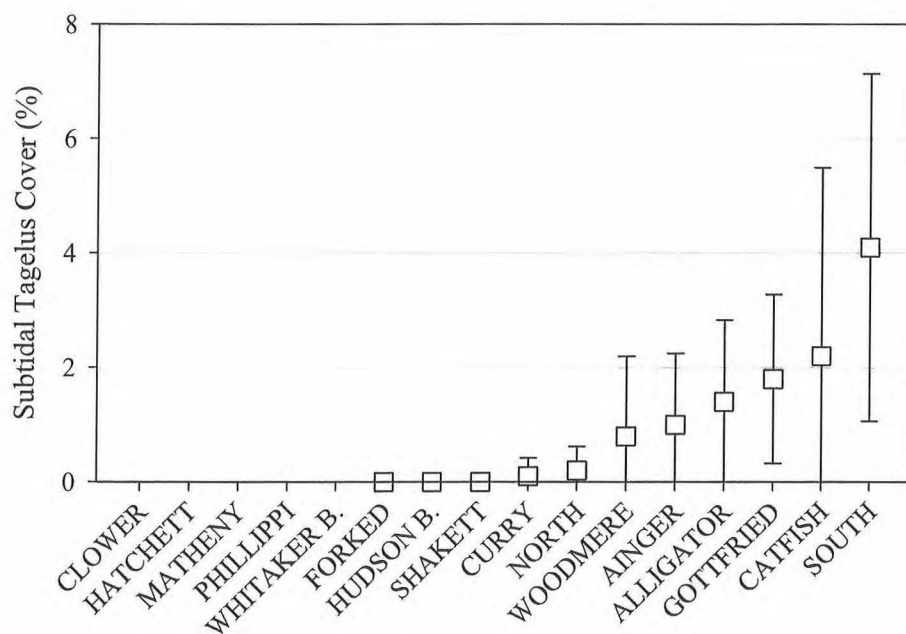
Intertidal Tagelus Cover (%)



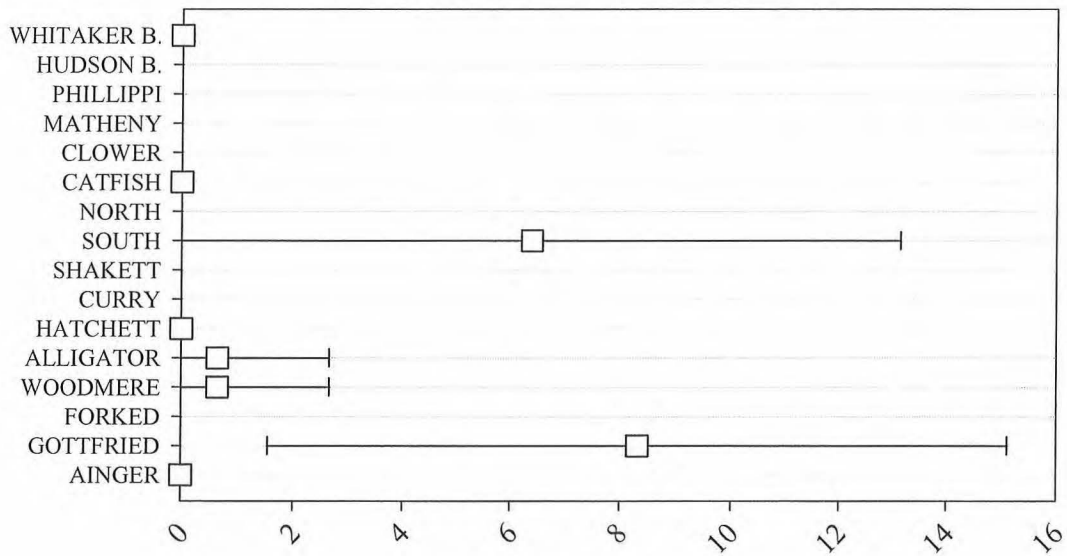
Subtidal Tagelus Cover (%)



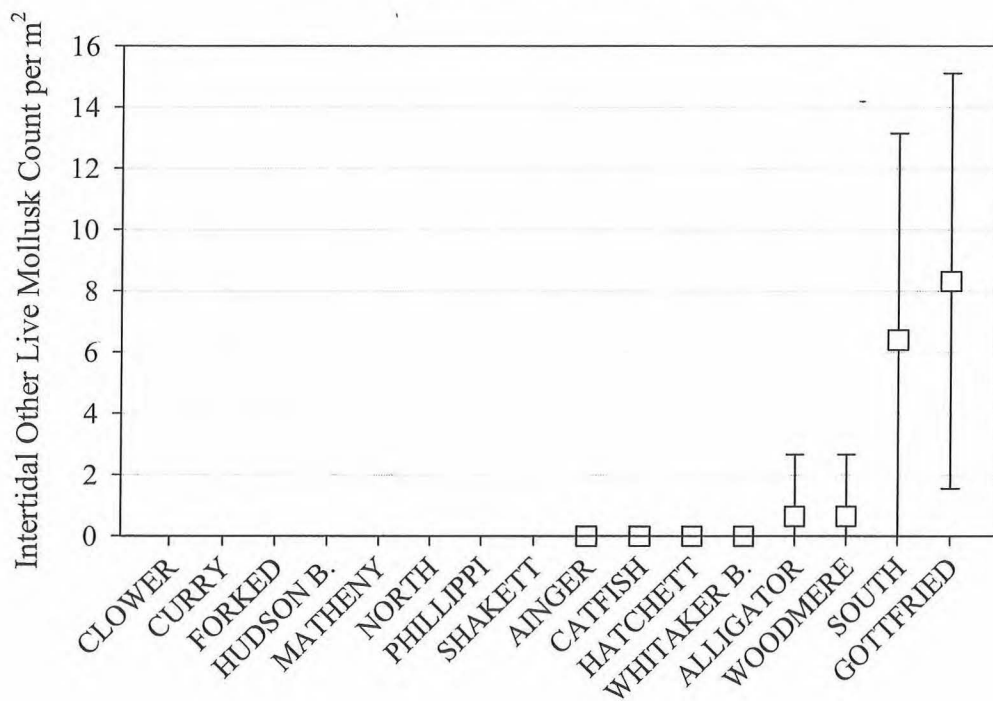
Subtidal Tagelus Cover (%)



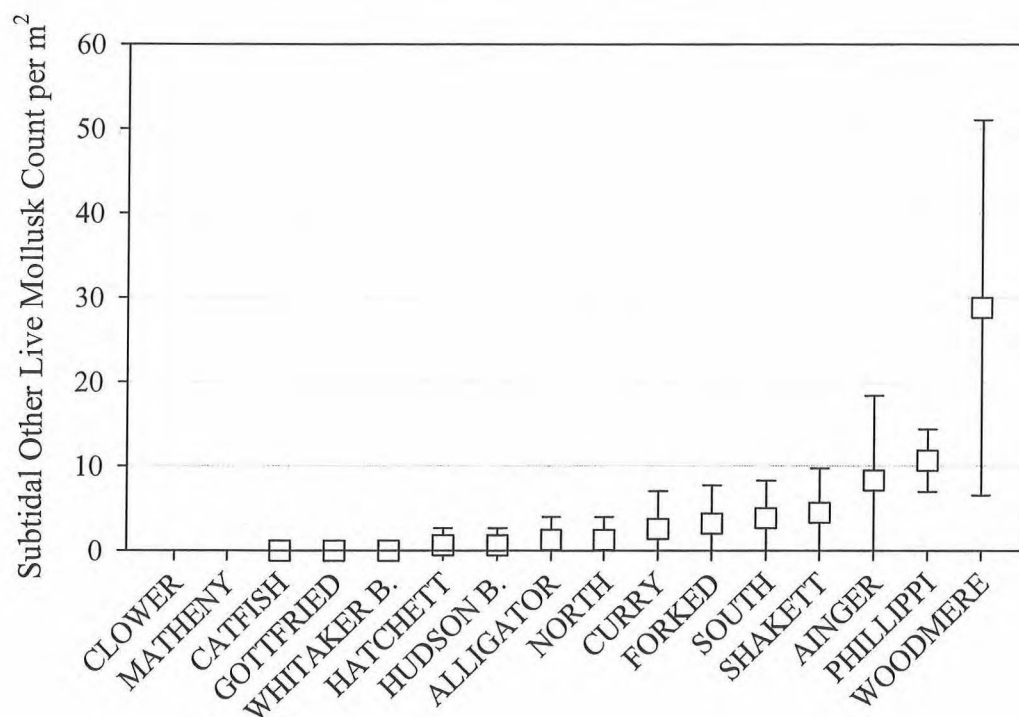
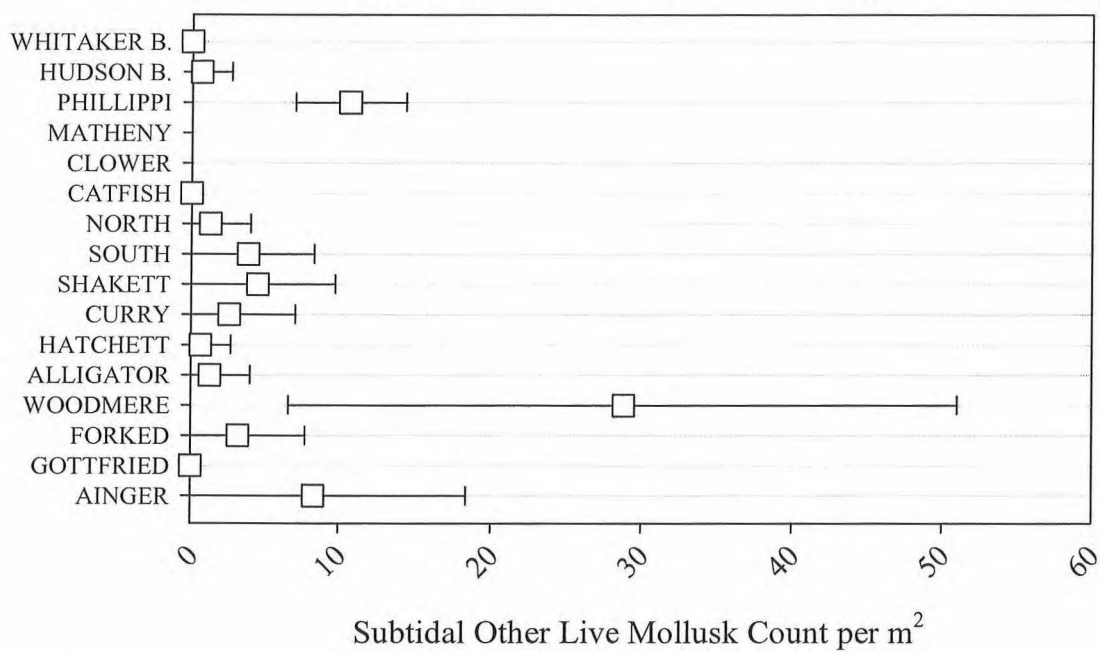
Intertidal Other Live Mollusk Count

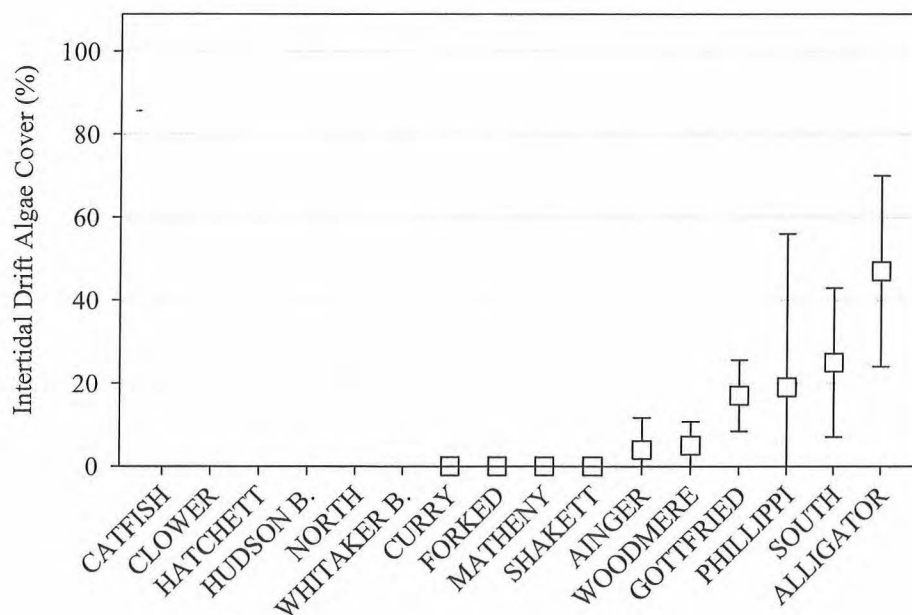
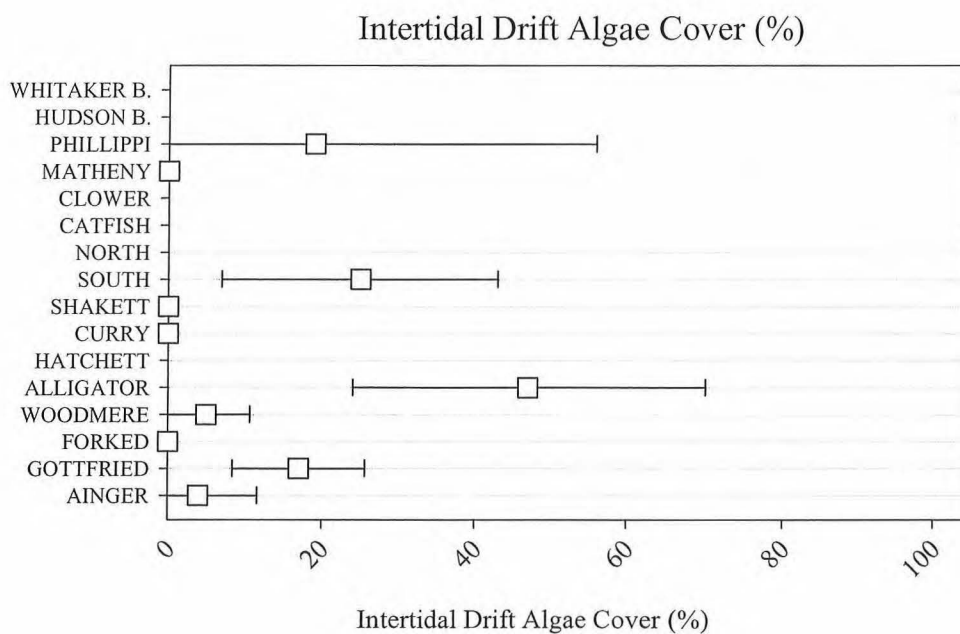


Intertidal Other Live Mollusk Count per m²

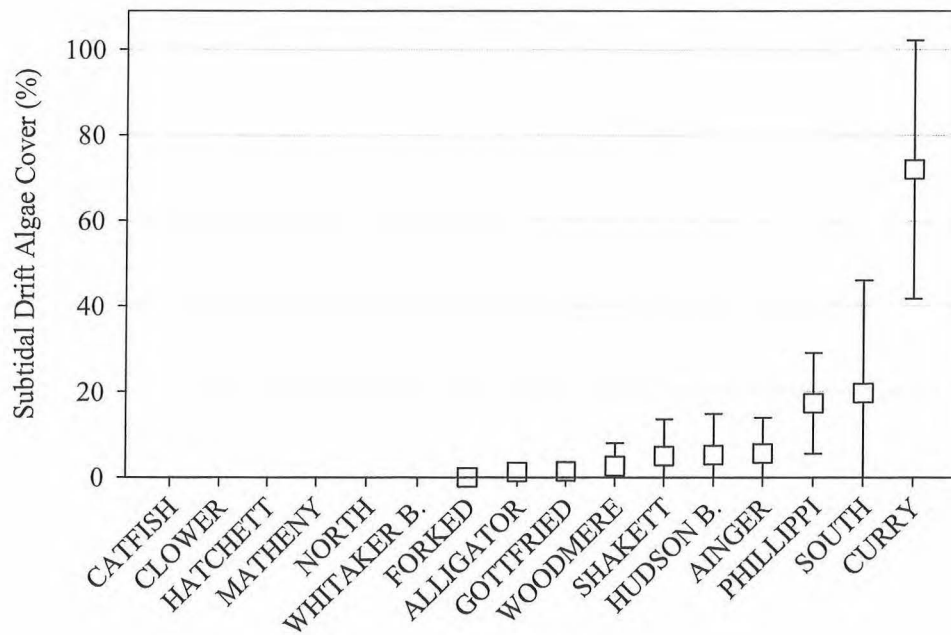
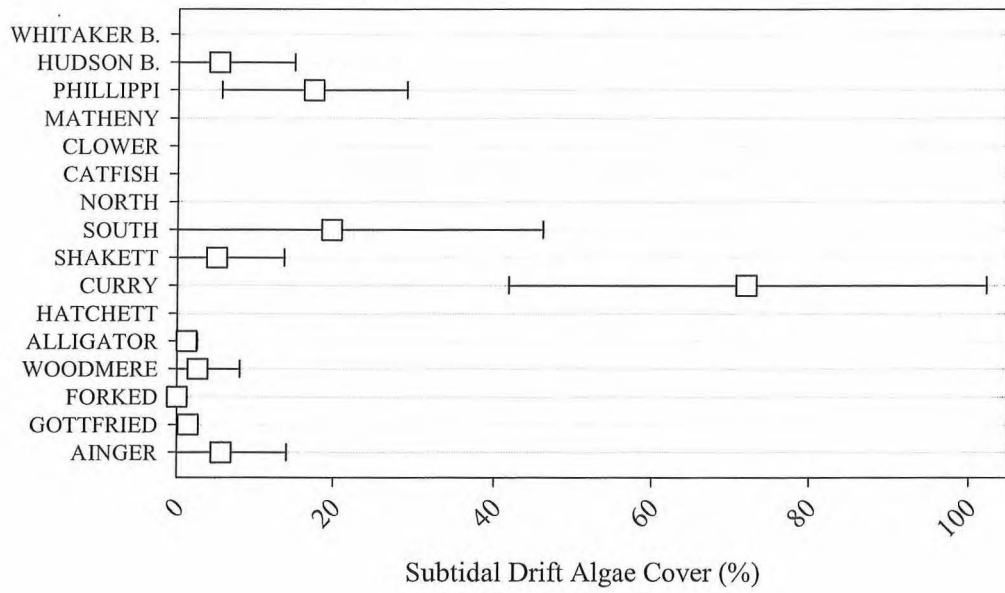


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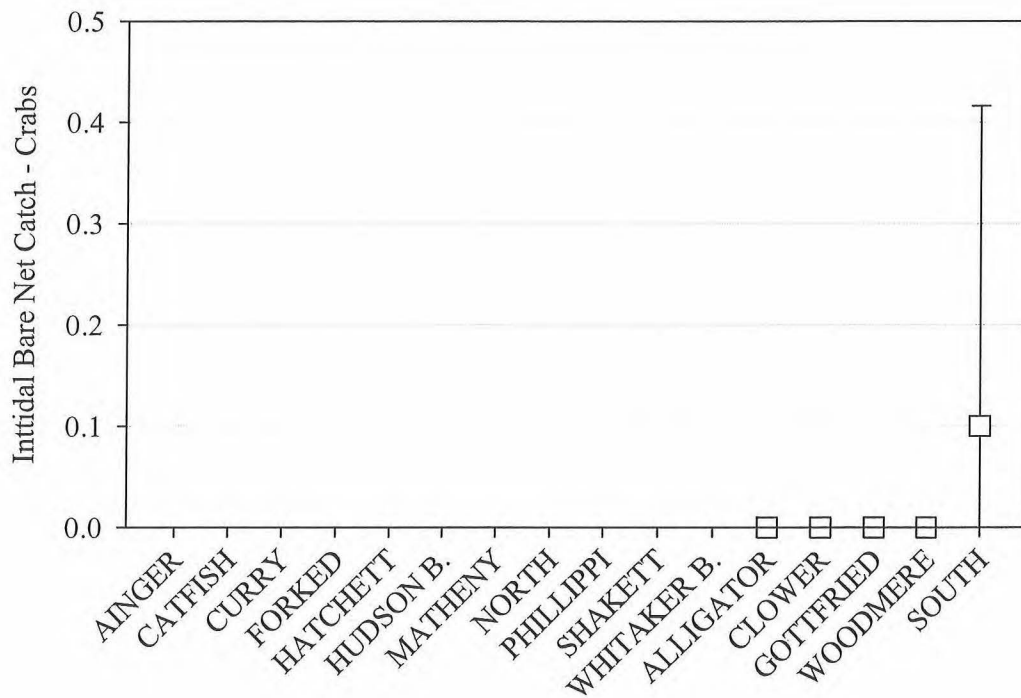
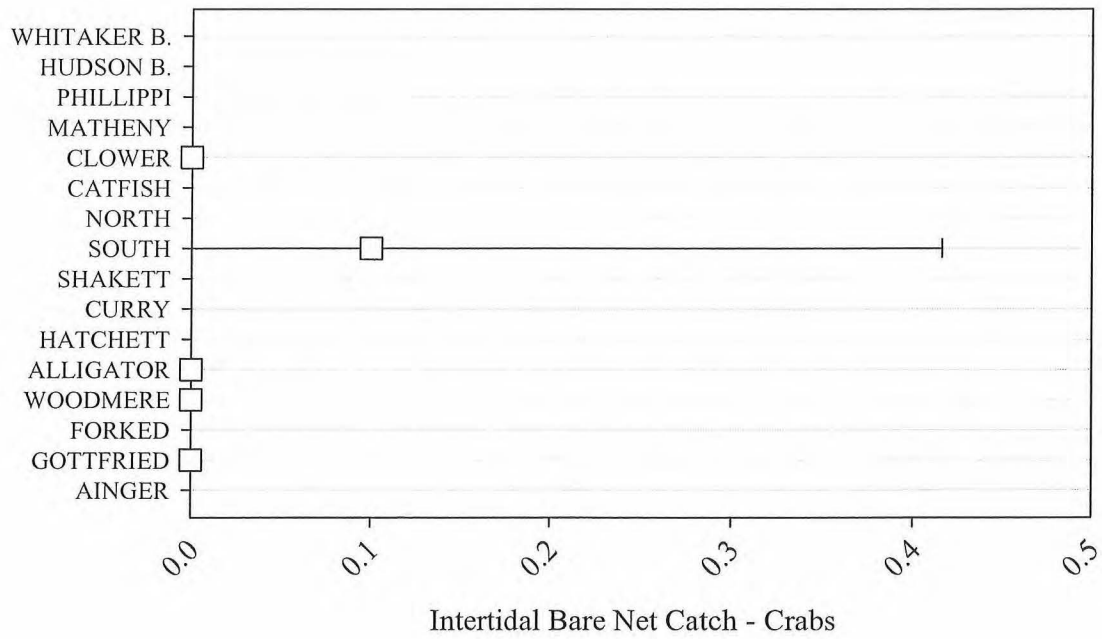




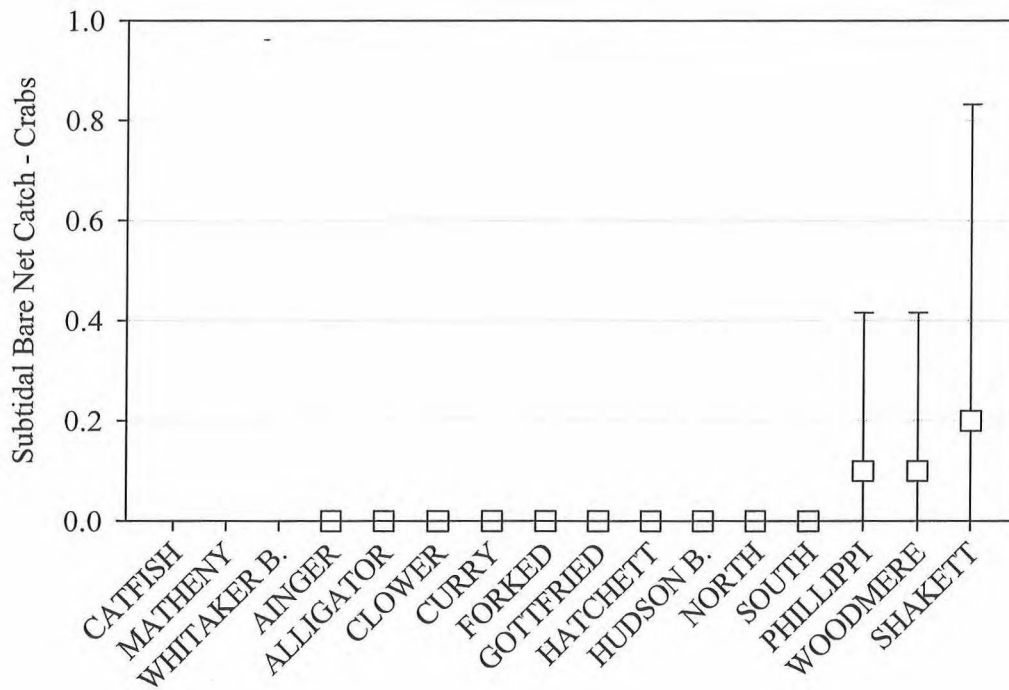
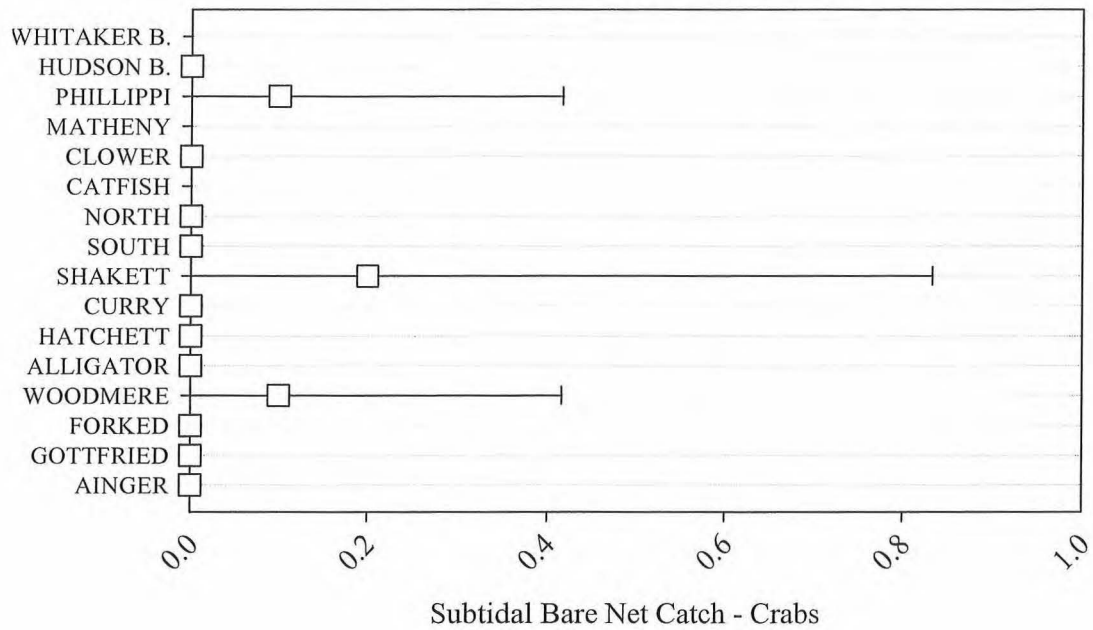
Subtidal Drift Algae Cover (%)



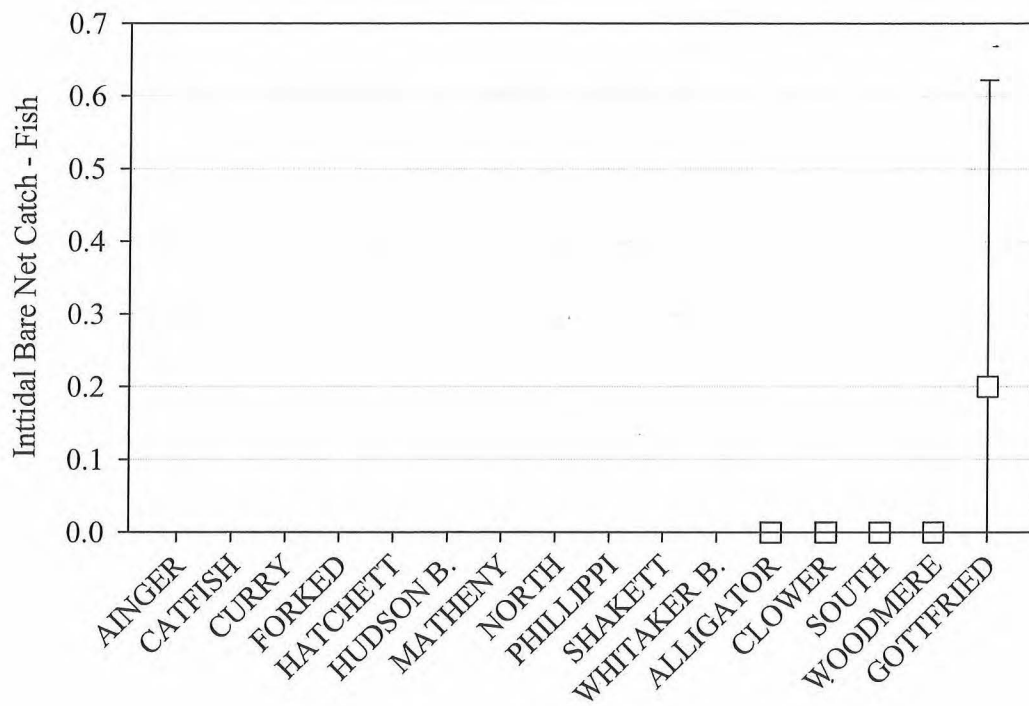
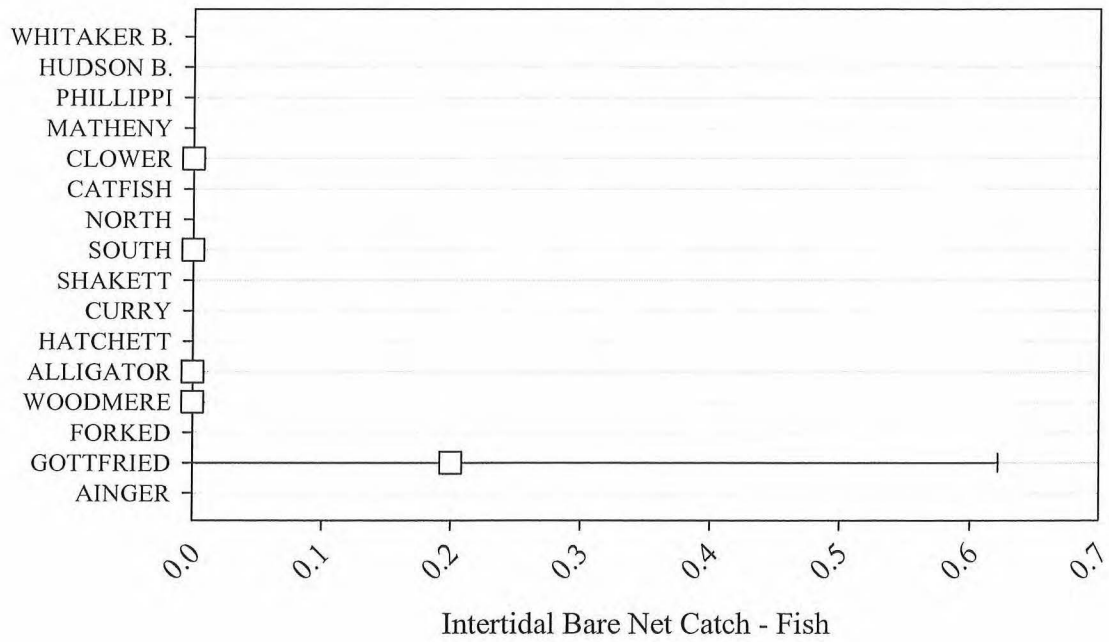
Intertidal Bare Net Catch - CRABS



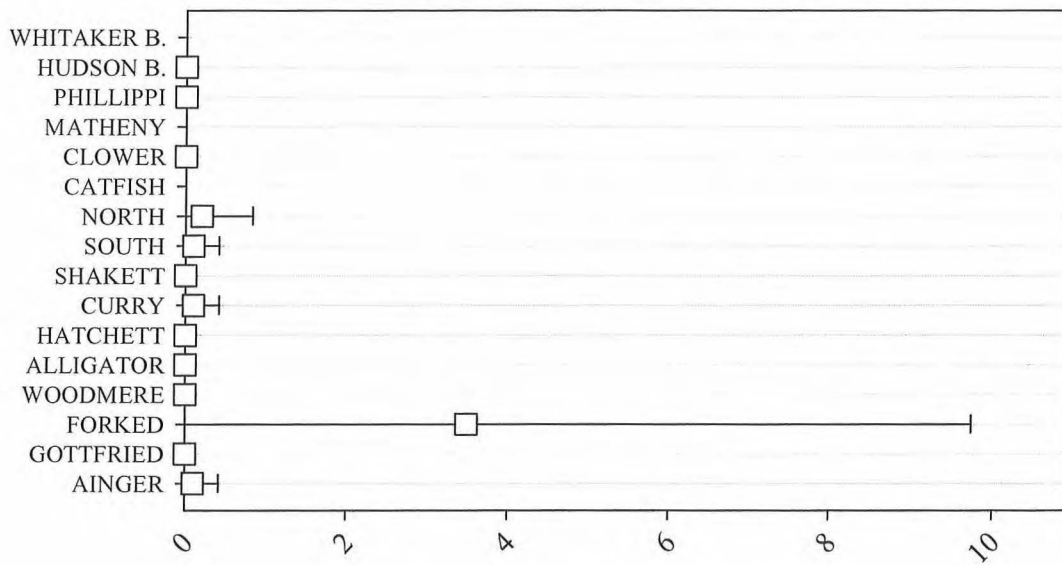
Subtidal Bare Net Catch - CRABS



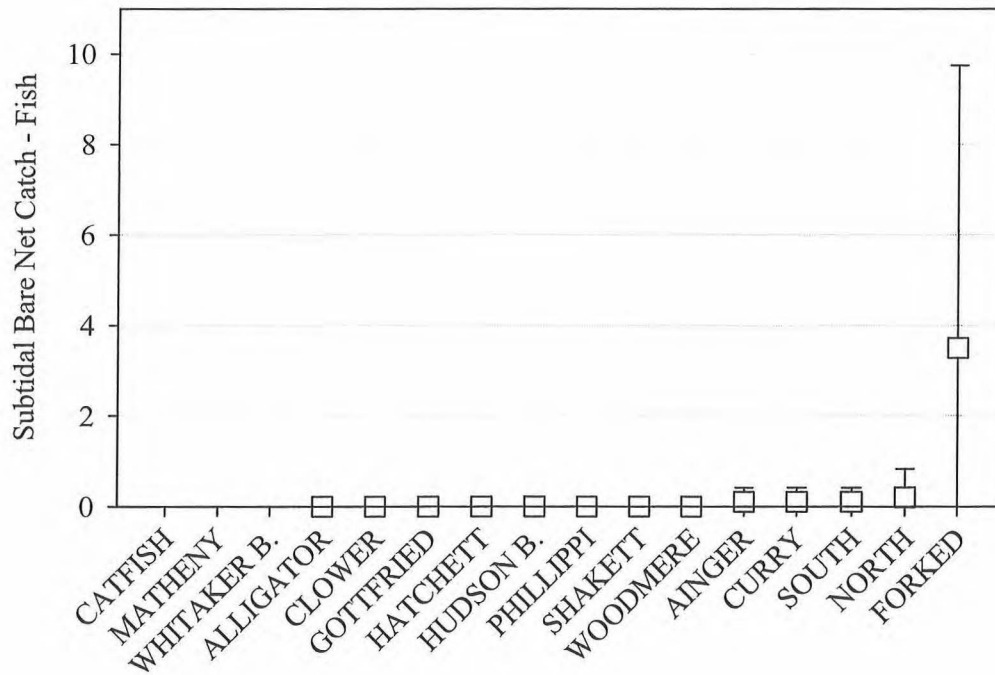
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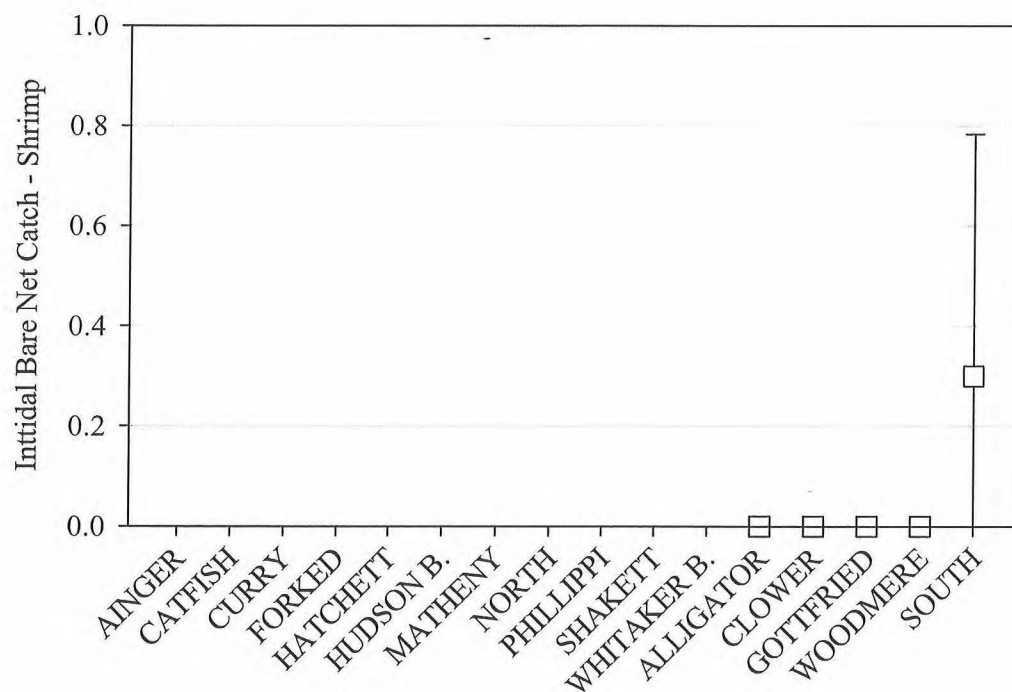
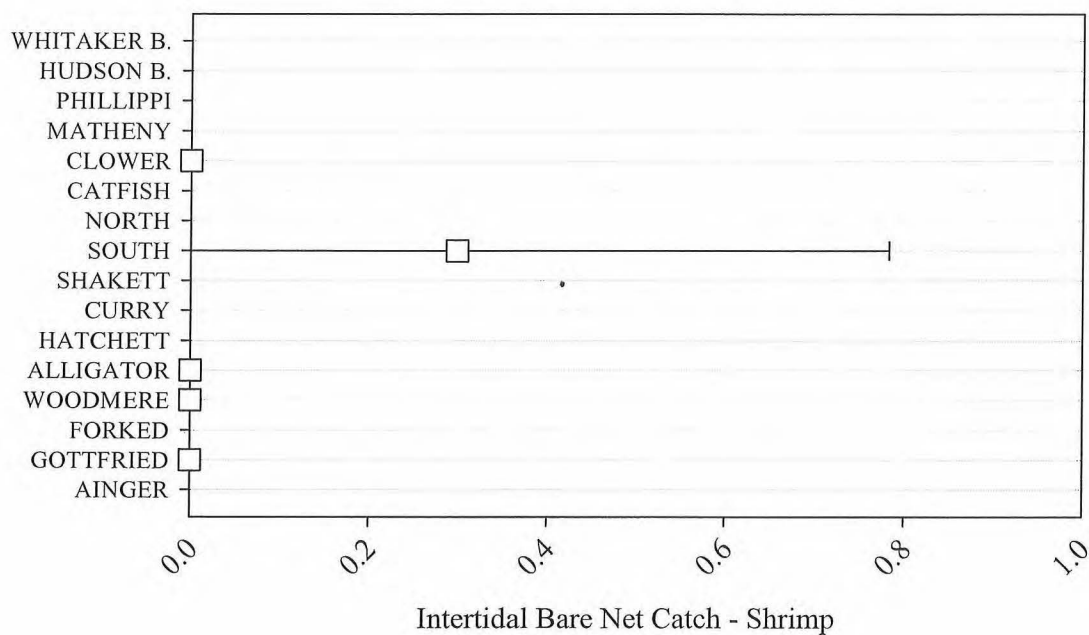
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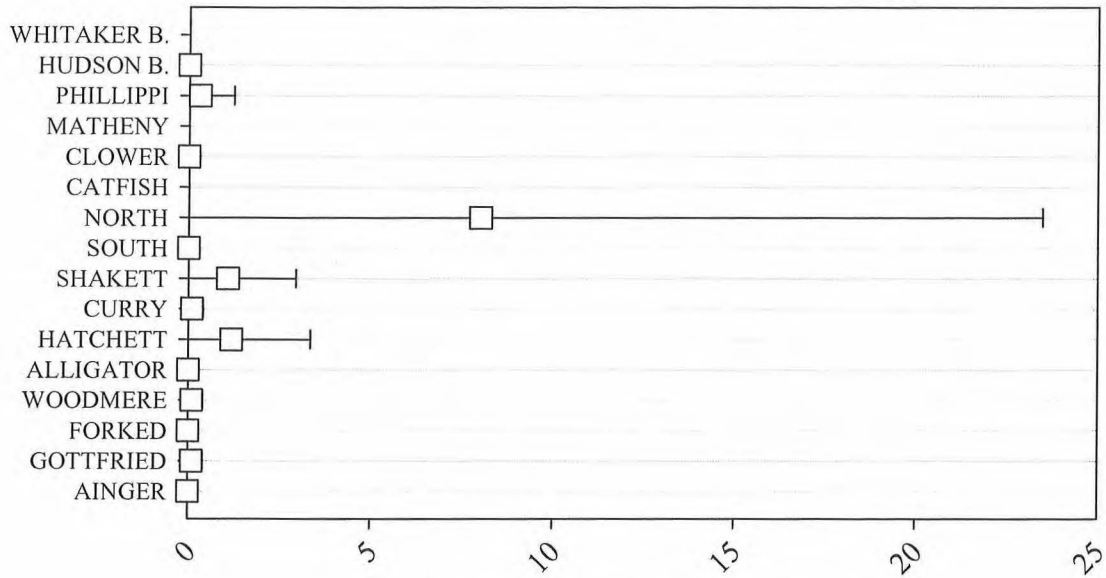
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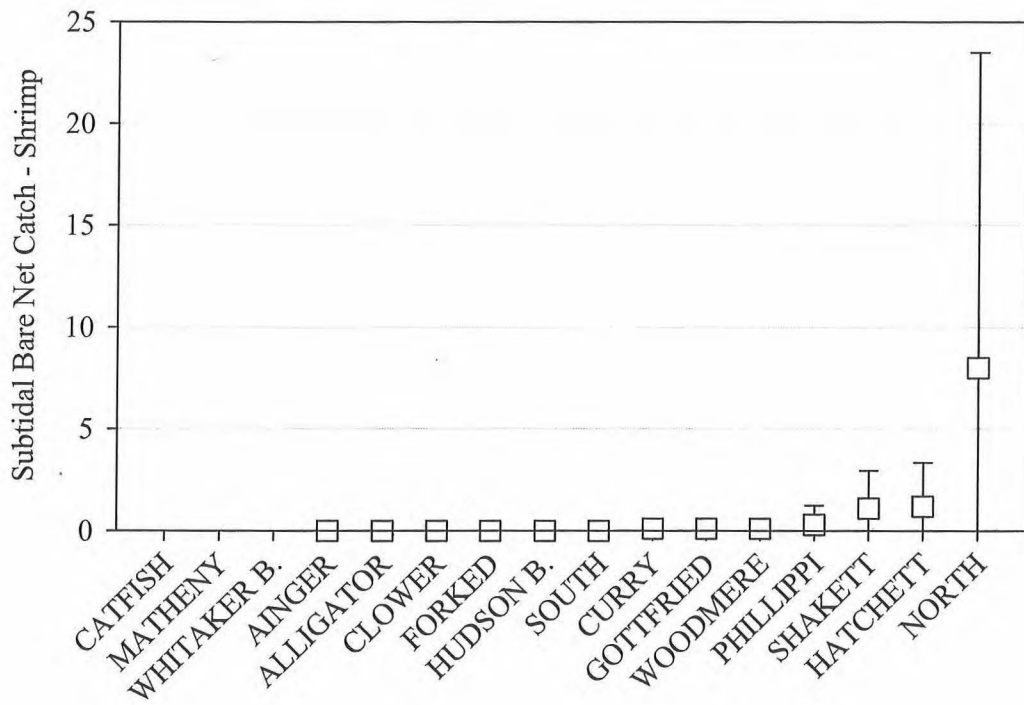
Intertidal Bare Net Catch - SHRIMP



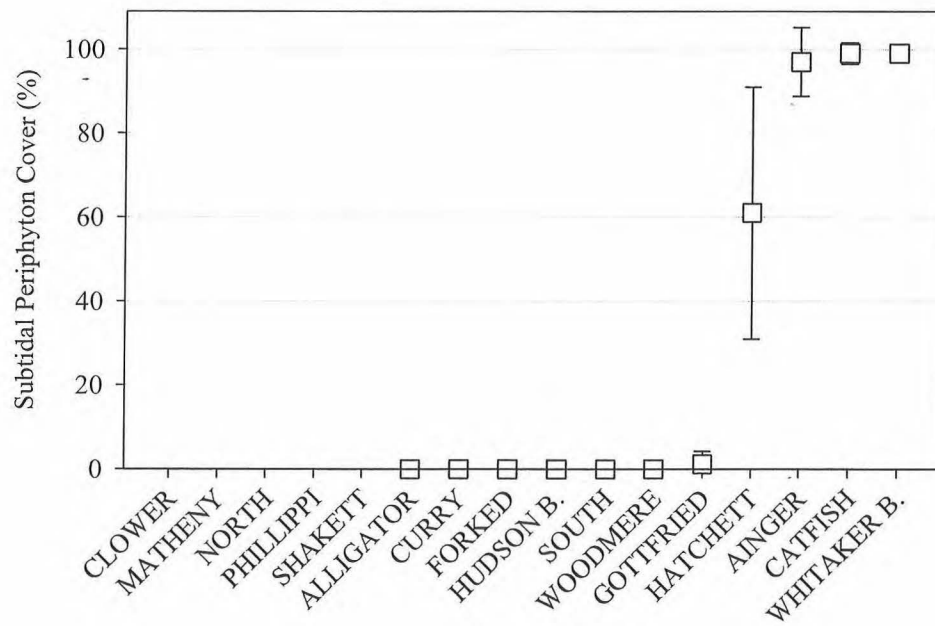
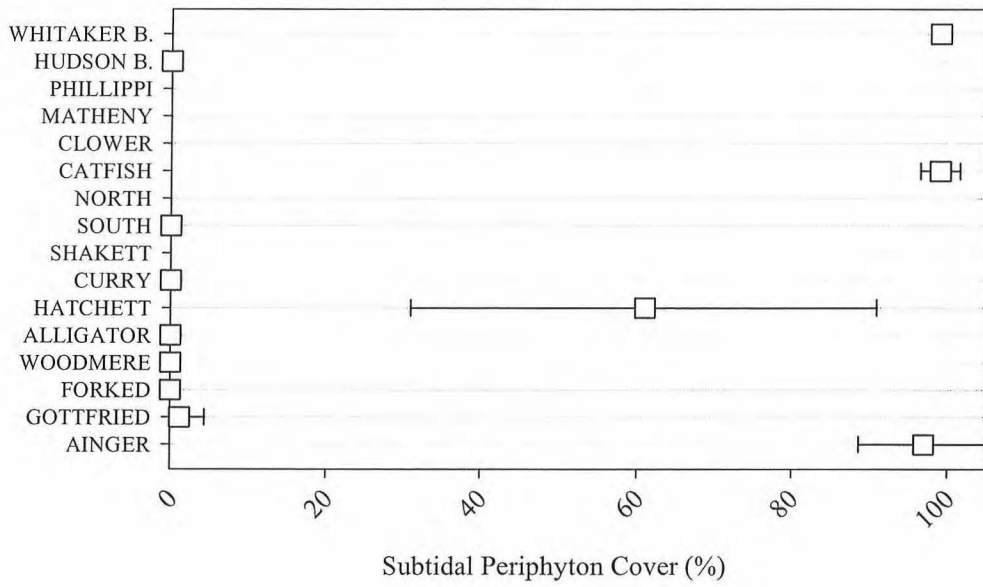
Subtidal Bare Net Catch - SHRIMP



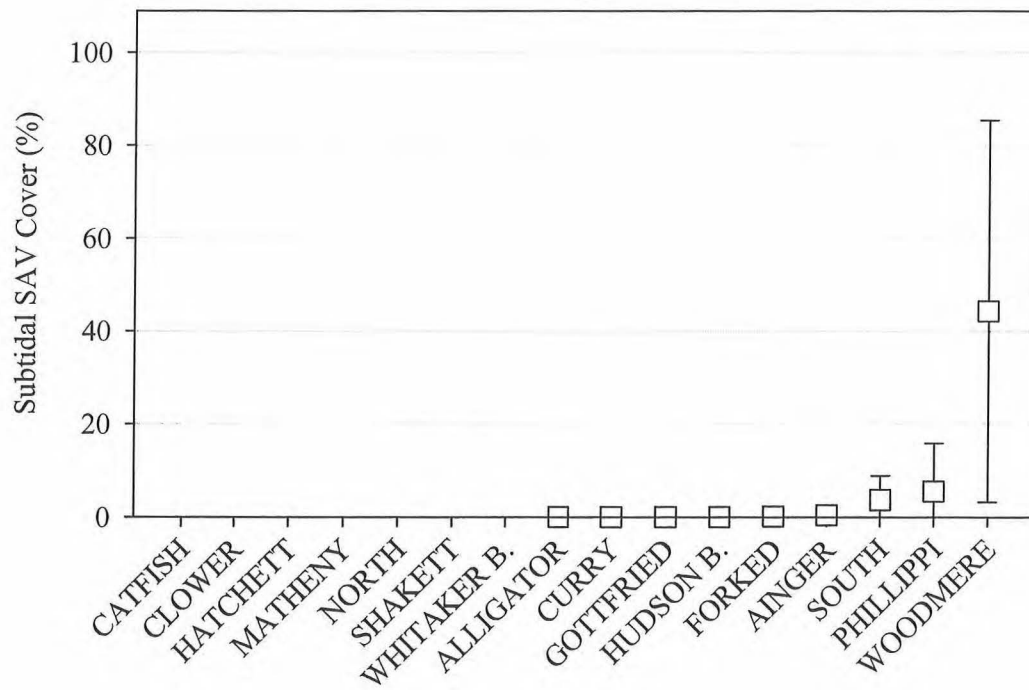
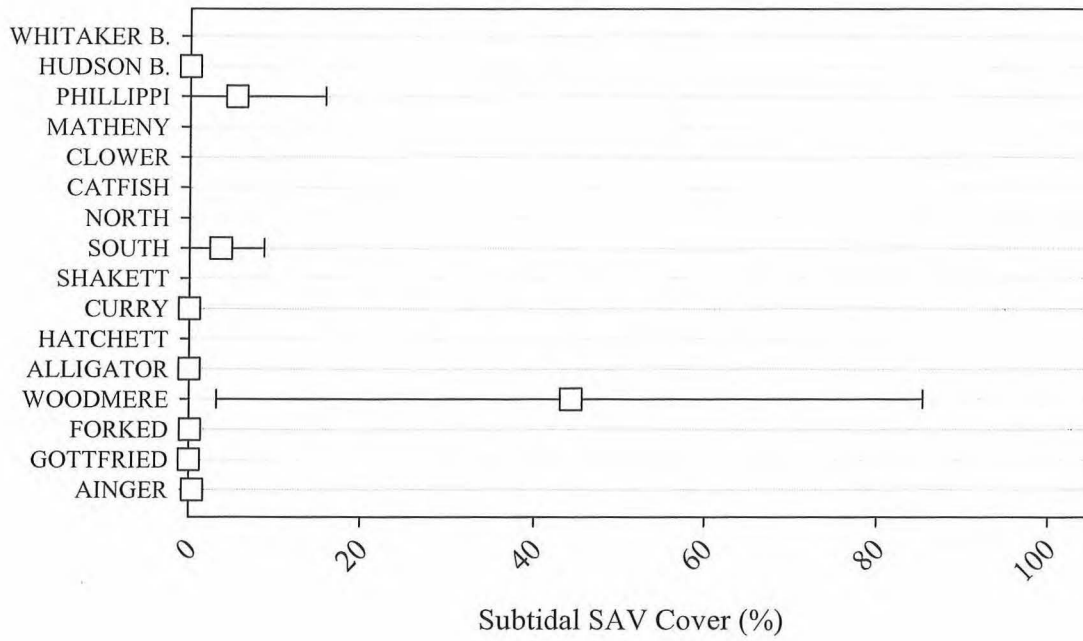
Subtidal Bare Net Catch - Shrimp



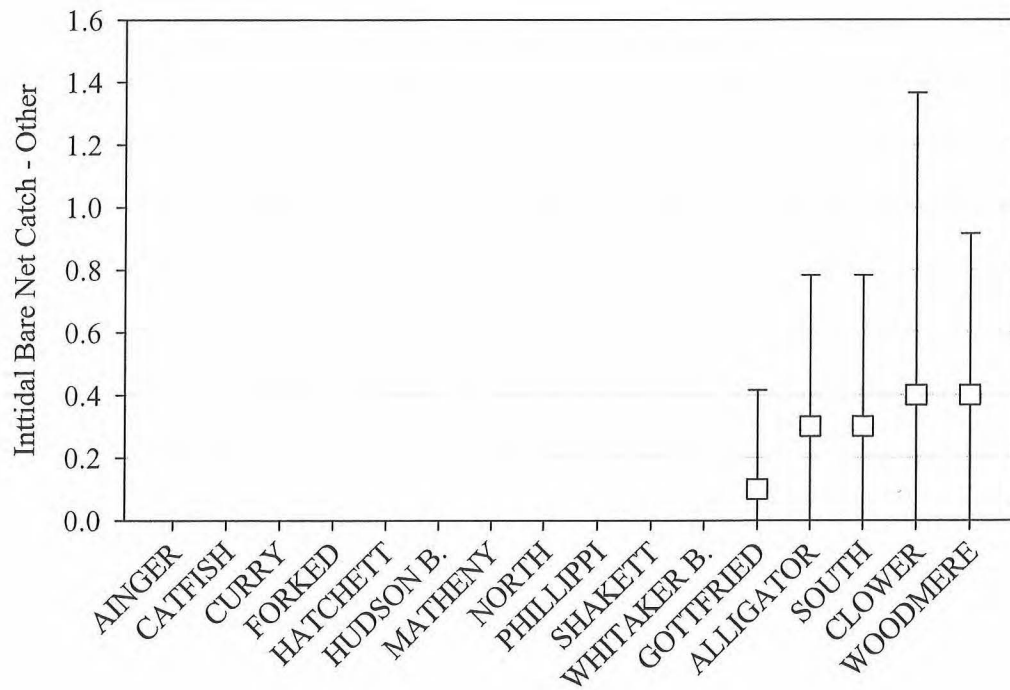
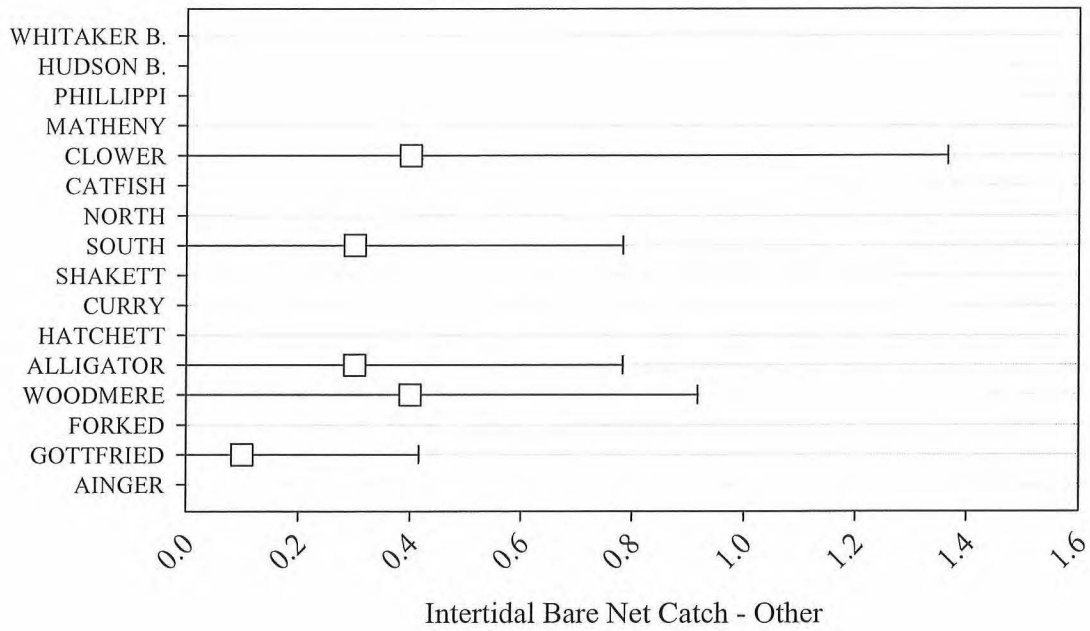
Subtidal Periphyton Cover (%)



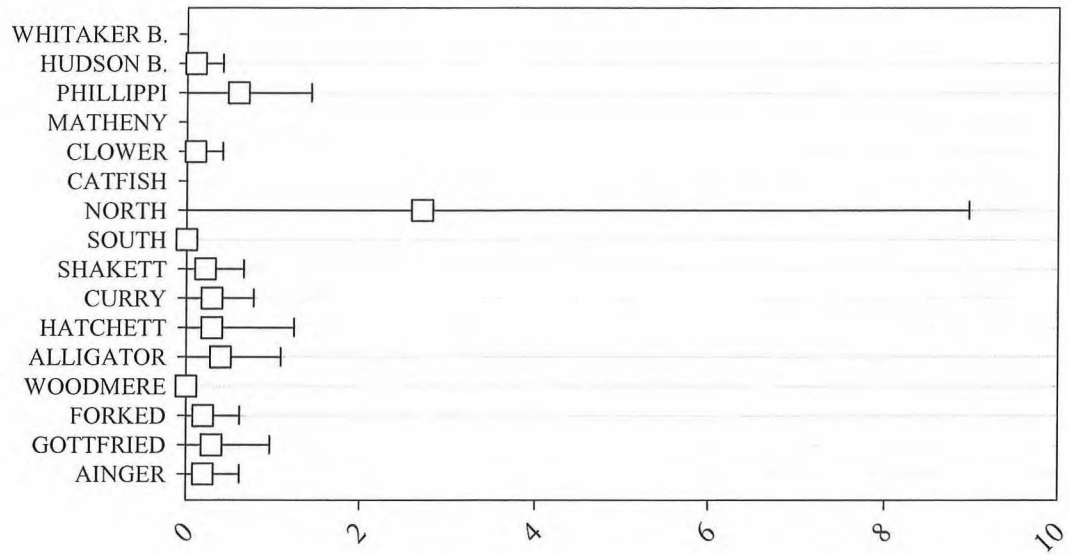
Subtidal SAV Cover (%)



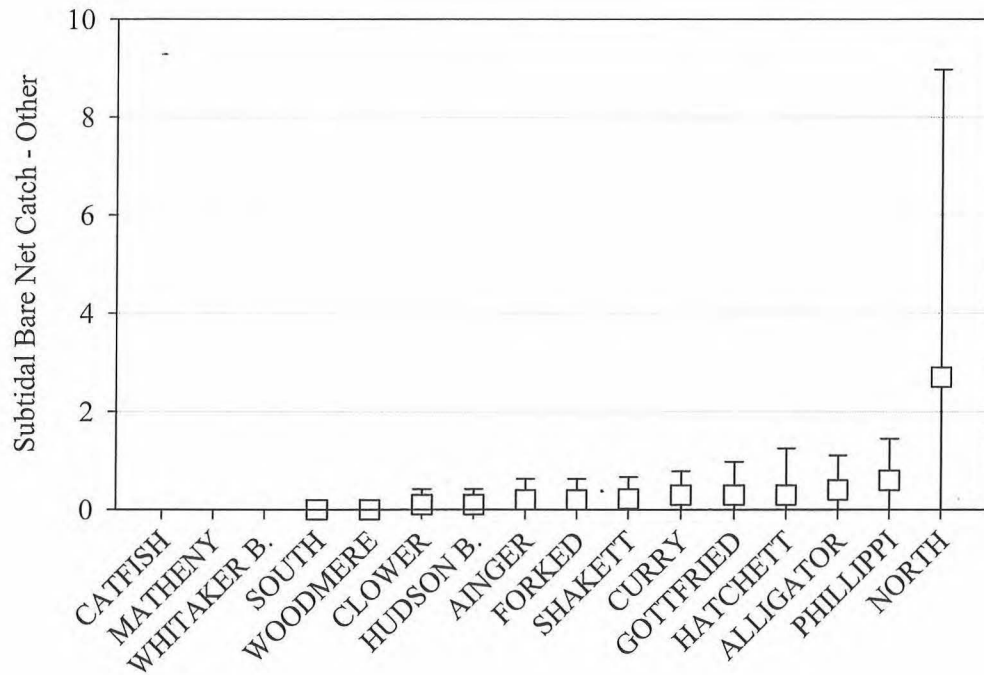
Intertidal Bare Net Catch - OTHER

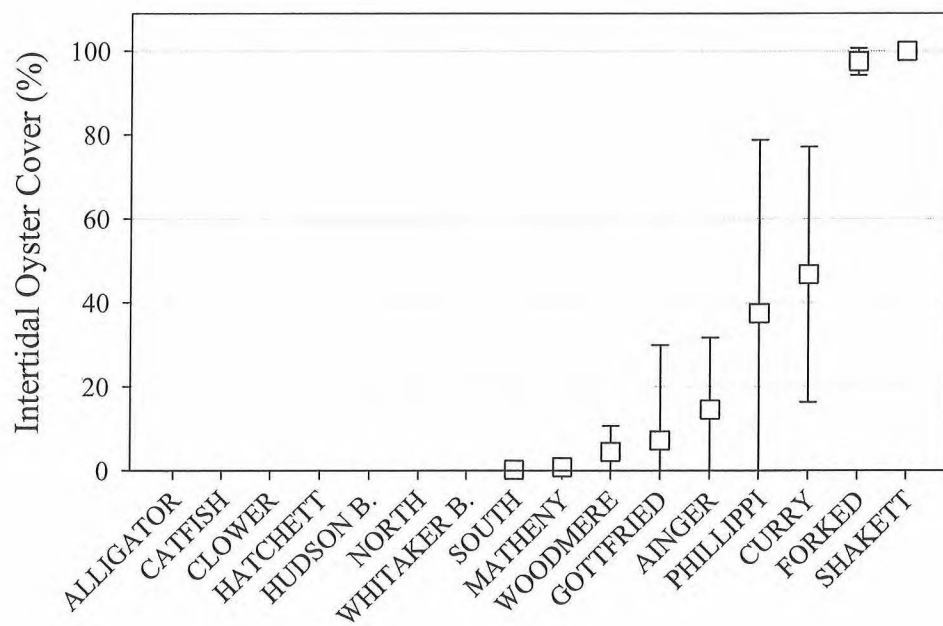
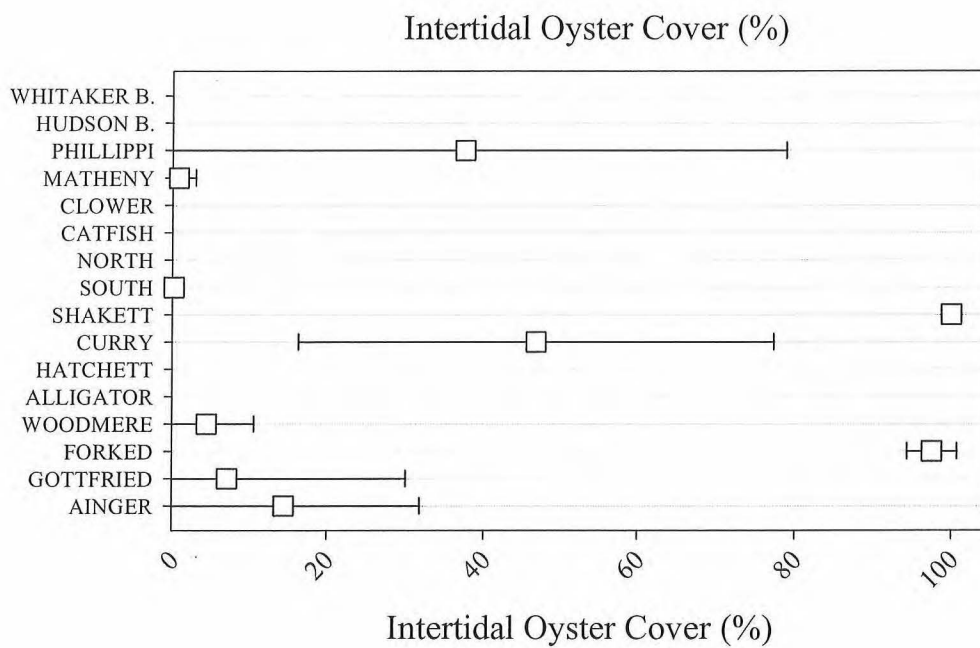


Subtidal Bare Net Catch - OTHER

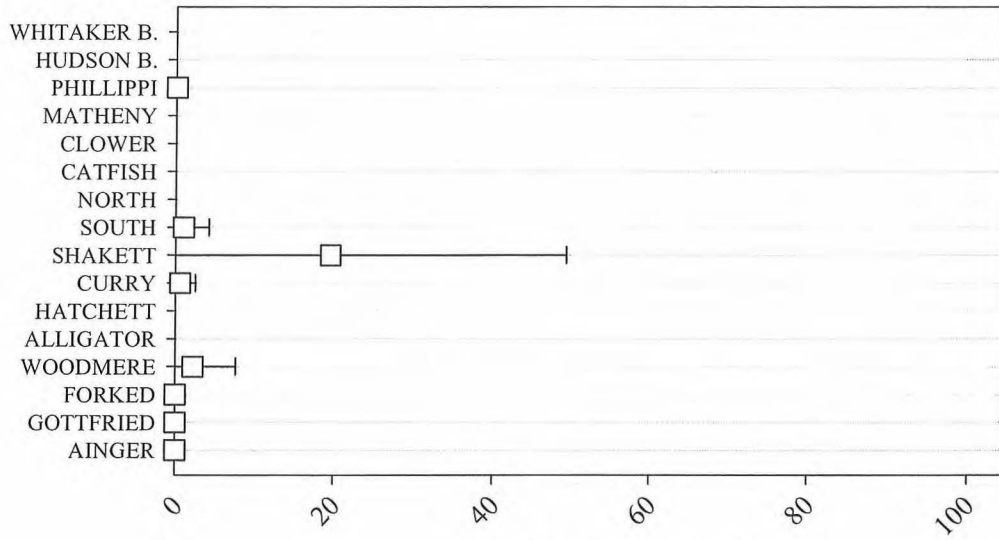


Subtidal Bare Net Catch - Other

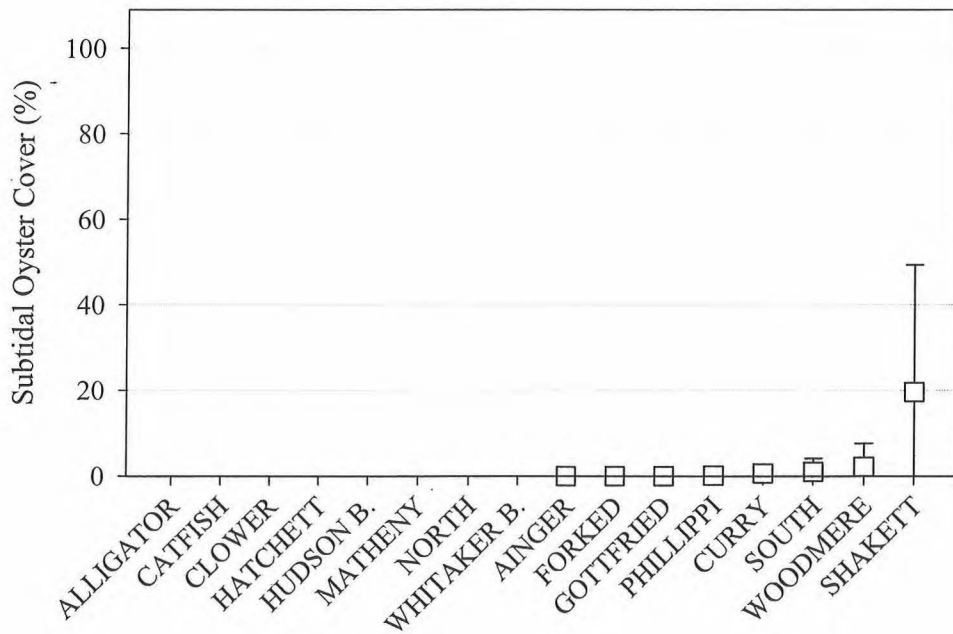


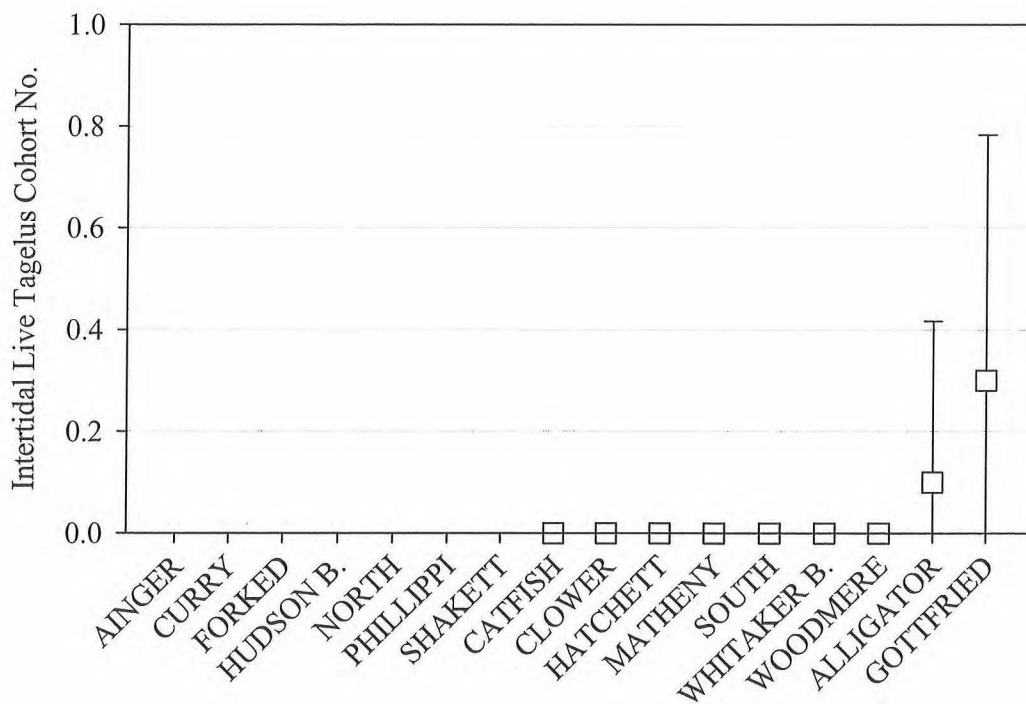
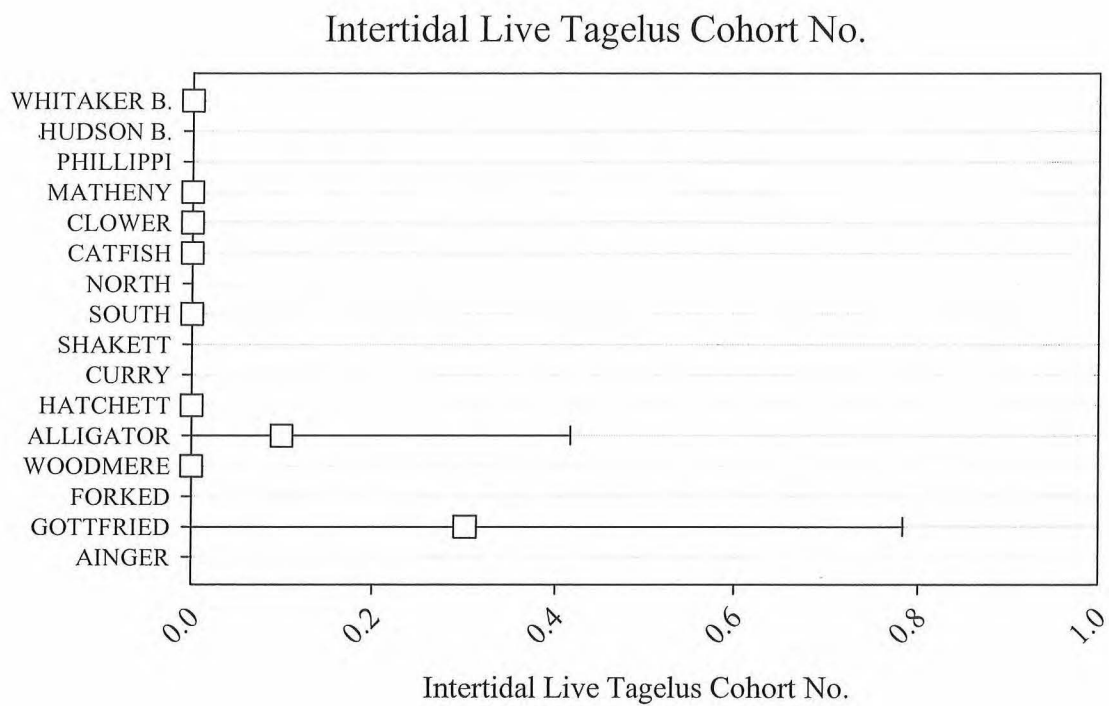


Subtidal Oyster Cover (%)

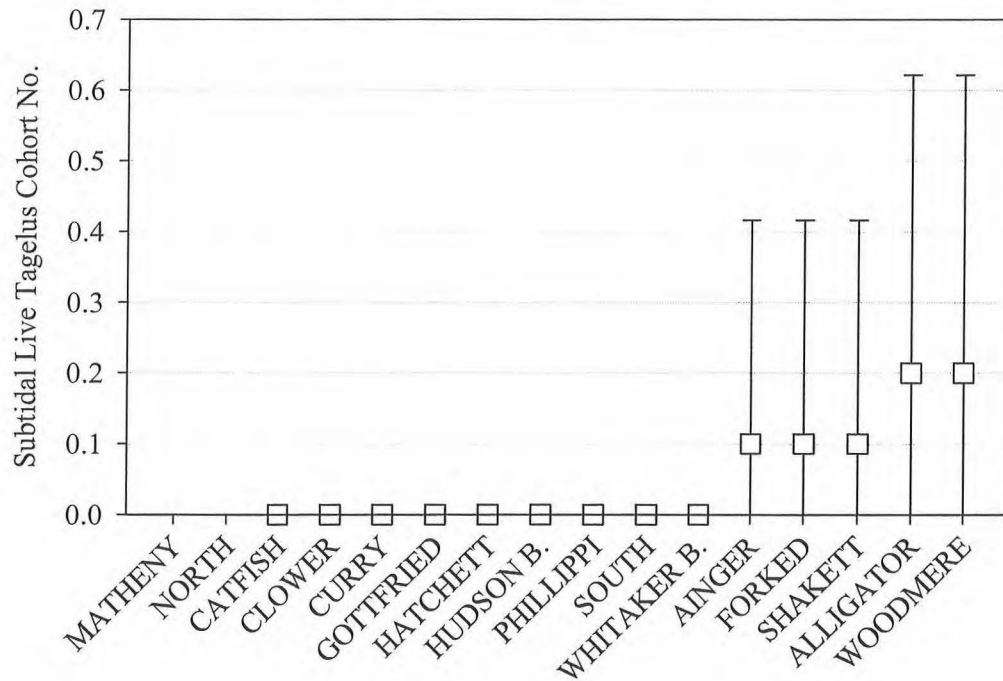
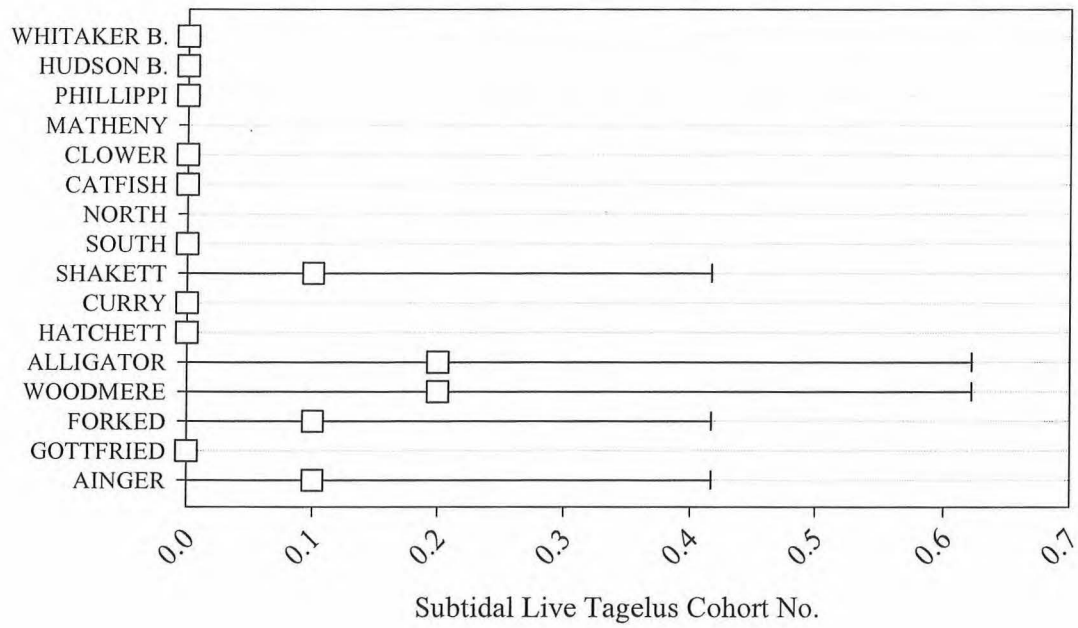


Subtidal Oyster Cover (%)

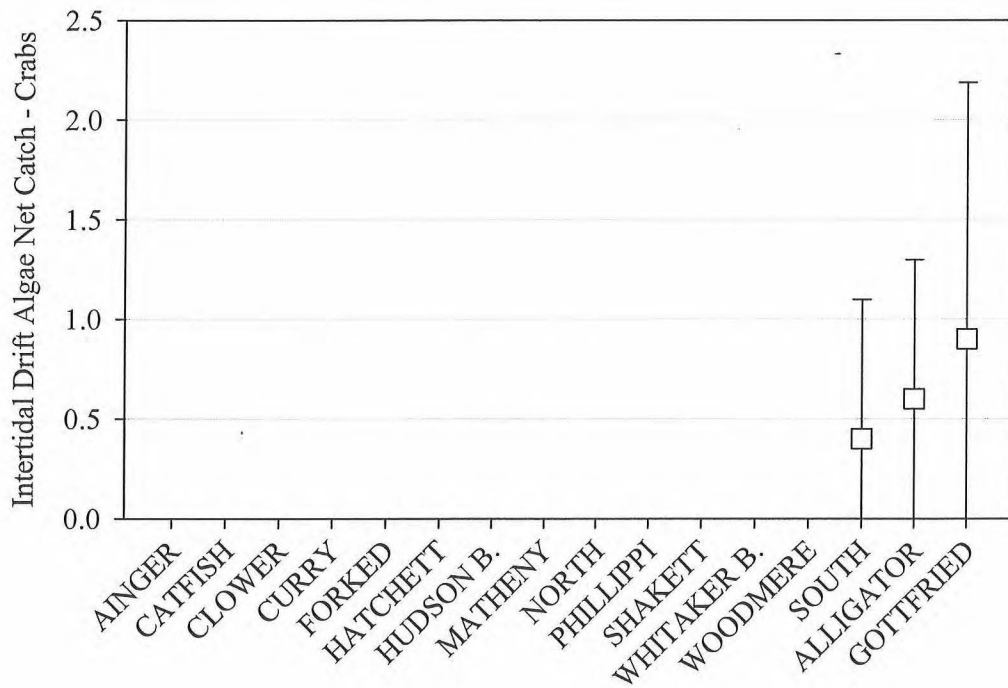
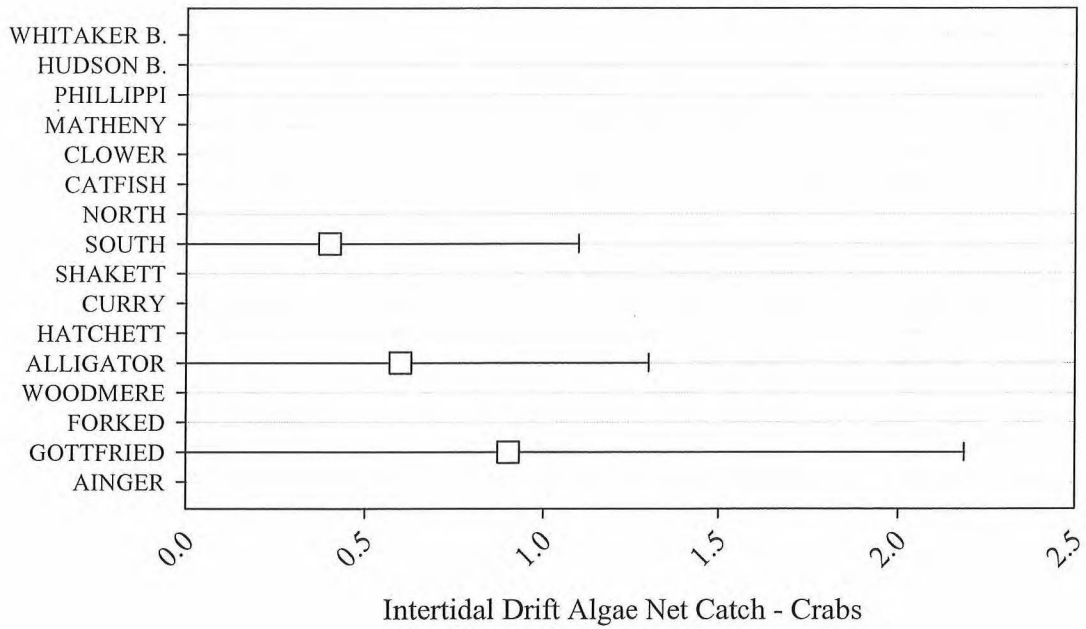




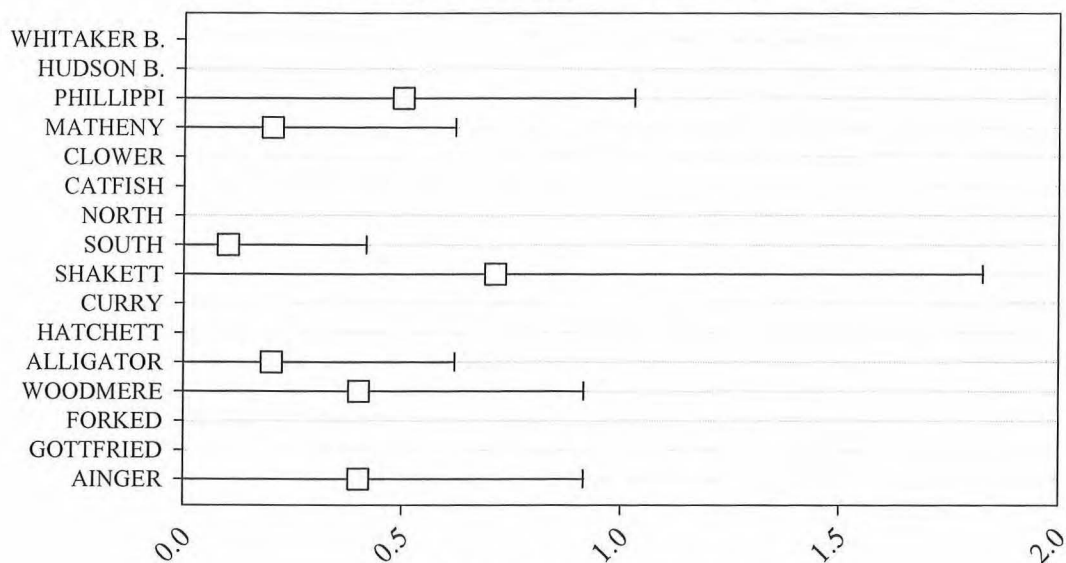
Subtidal Live Tagelus Cohort No.



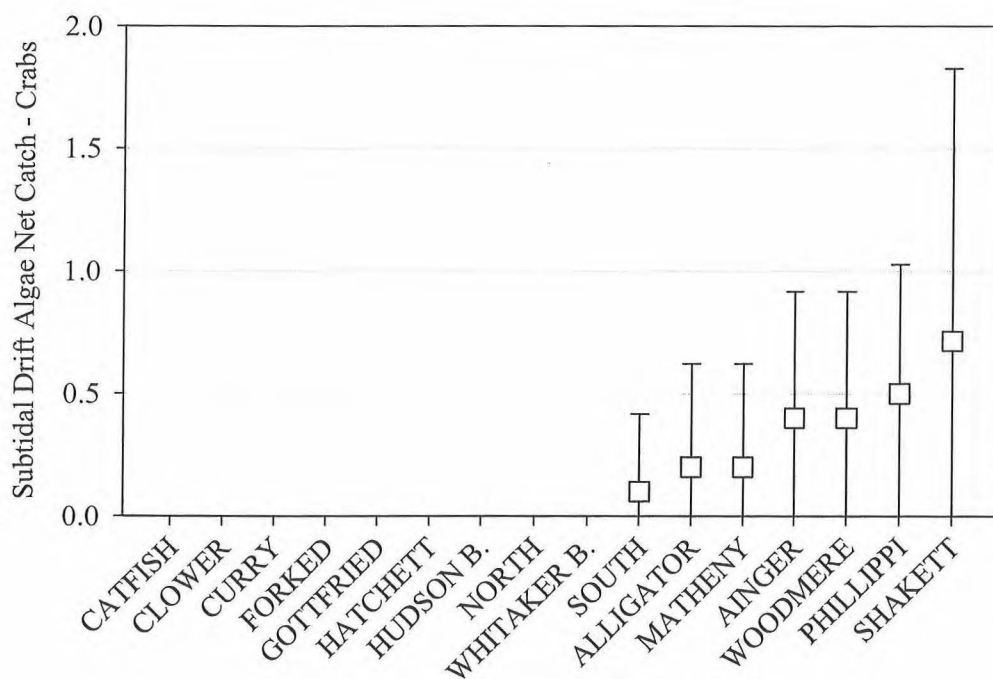
Intertidal Drift Algae Net Catch - CRABS



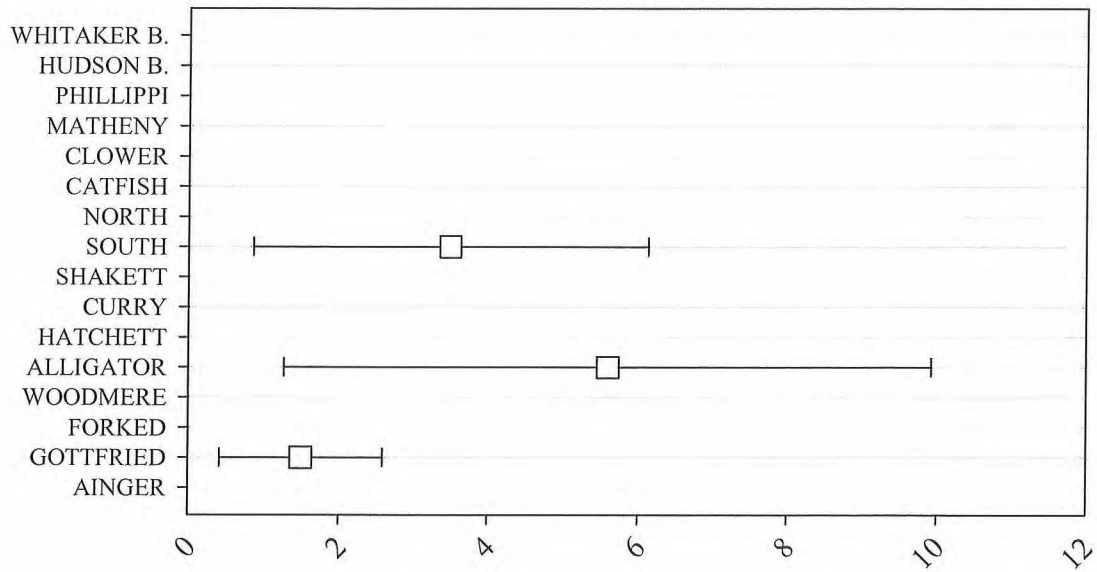
Subtidal Drift Algae Net Catch - CRABS



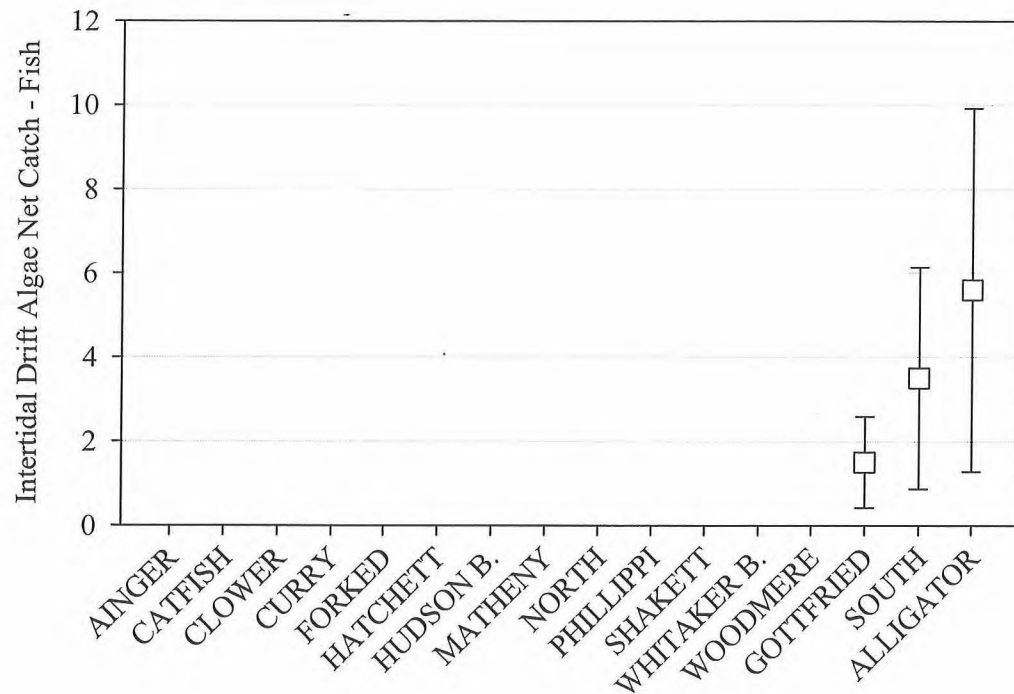
Subtidal Drift Algae Net Catch - Crabs



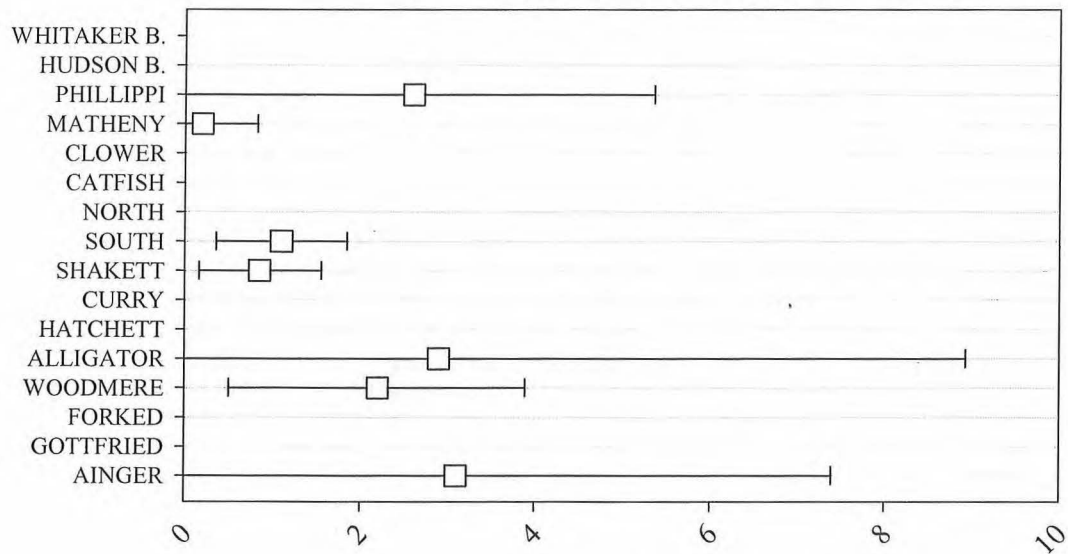
Intertidal Drift Algae Net Catch - FISH



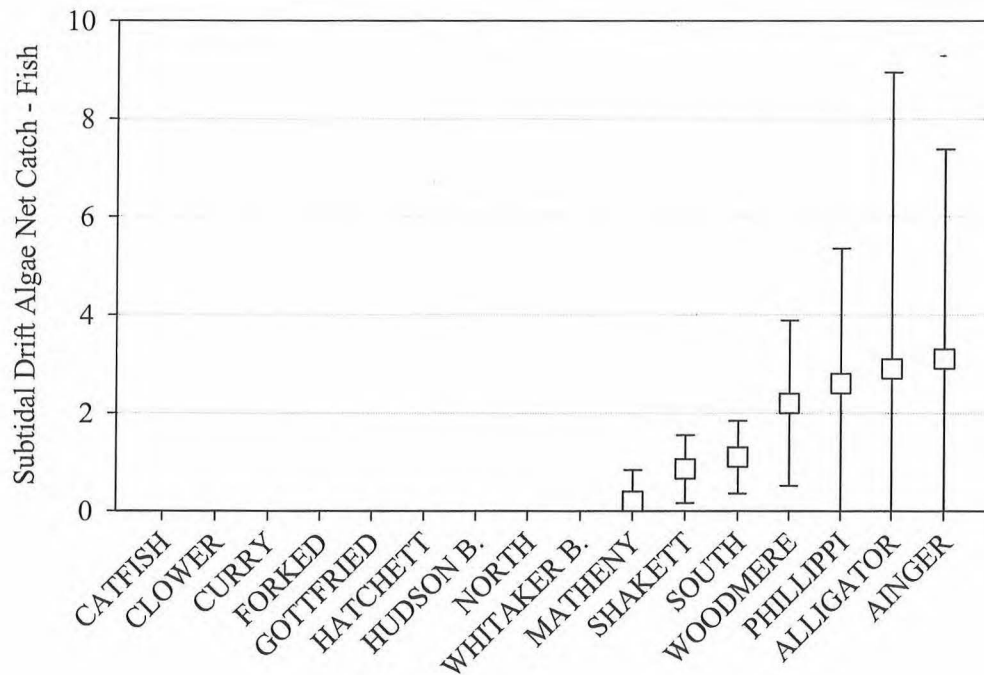
Intertidal Drift Algae Net Catch - Fish



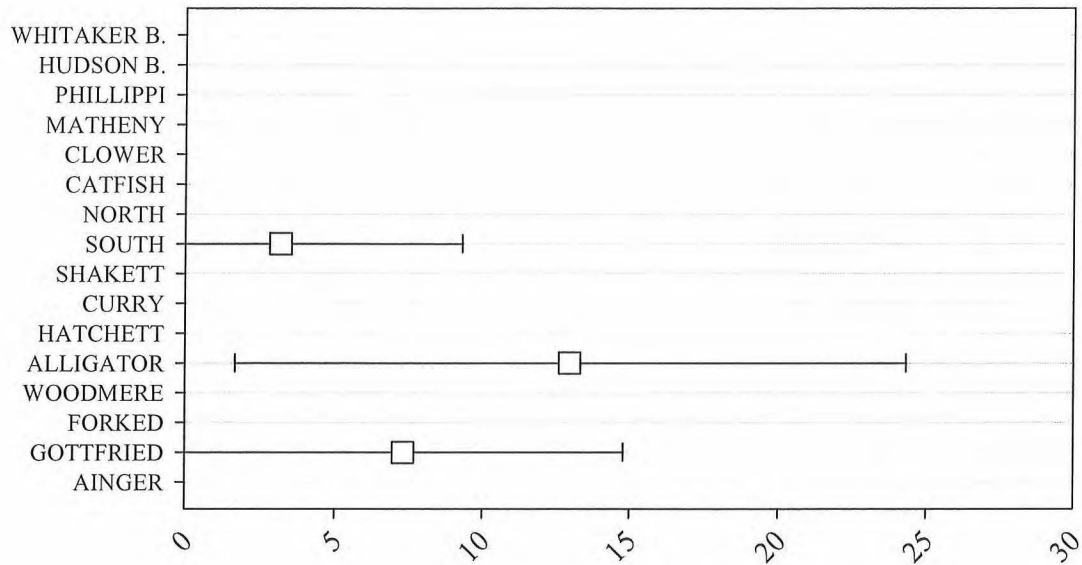
Subtidal Drift Algae Net Catch - FISH



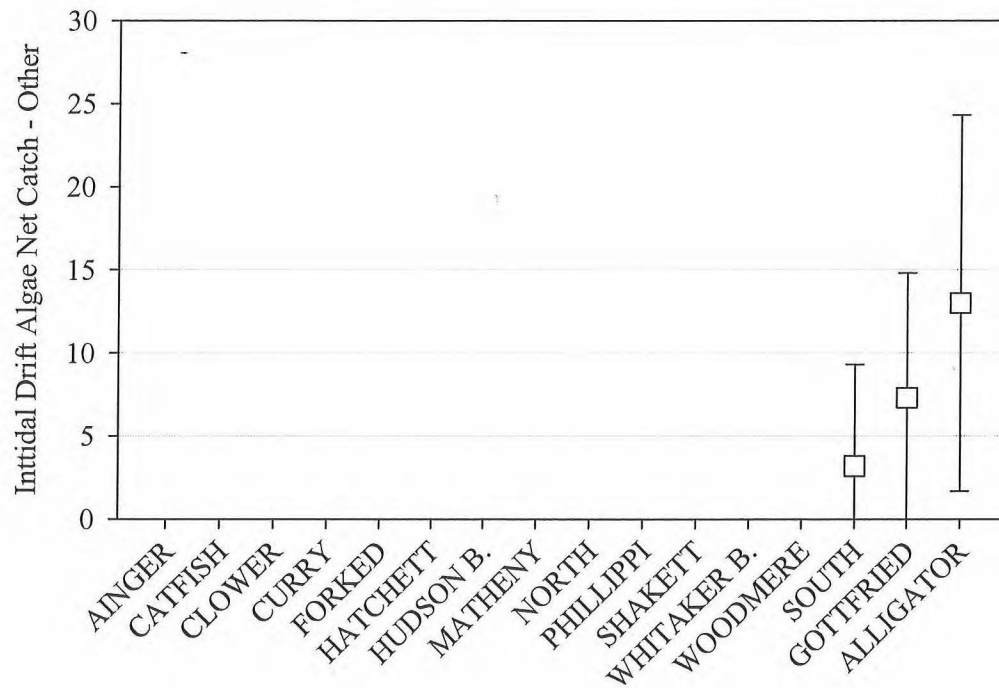
Subtidal Drift Algae Net Catch - Fish



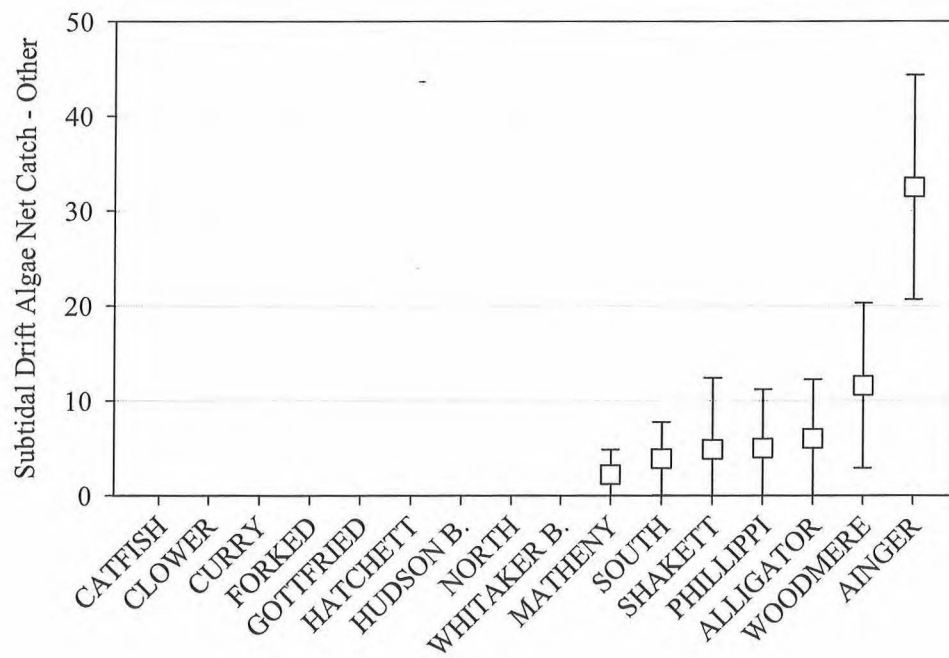
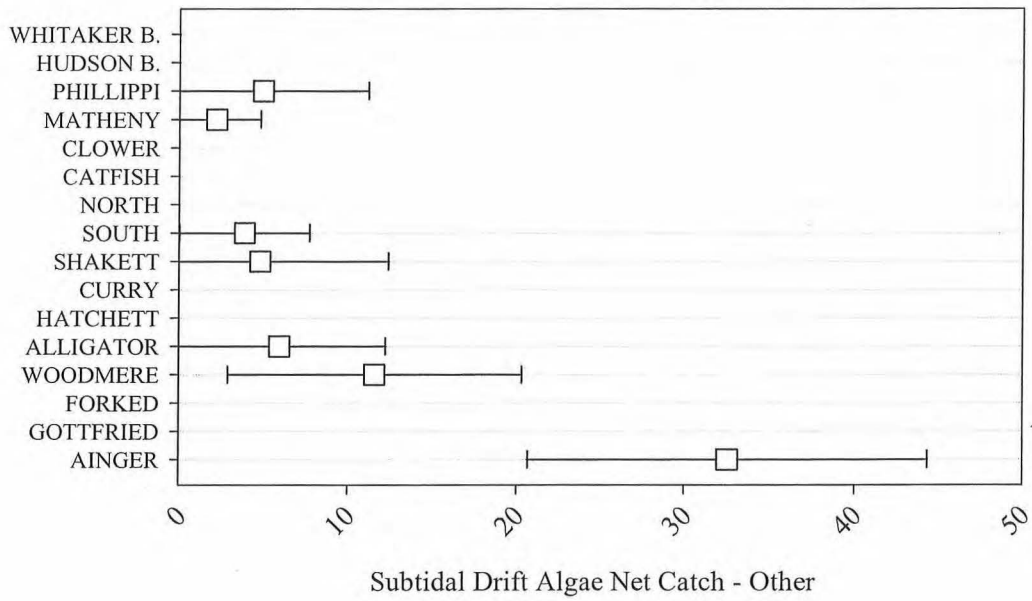
Intertidal Drift Algae Net Catch - OTHER



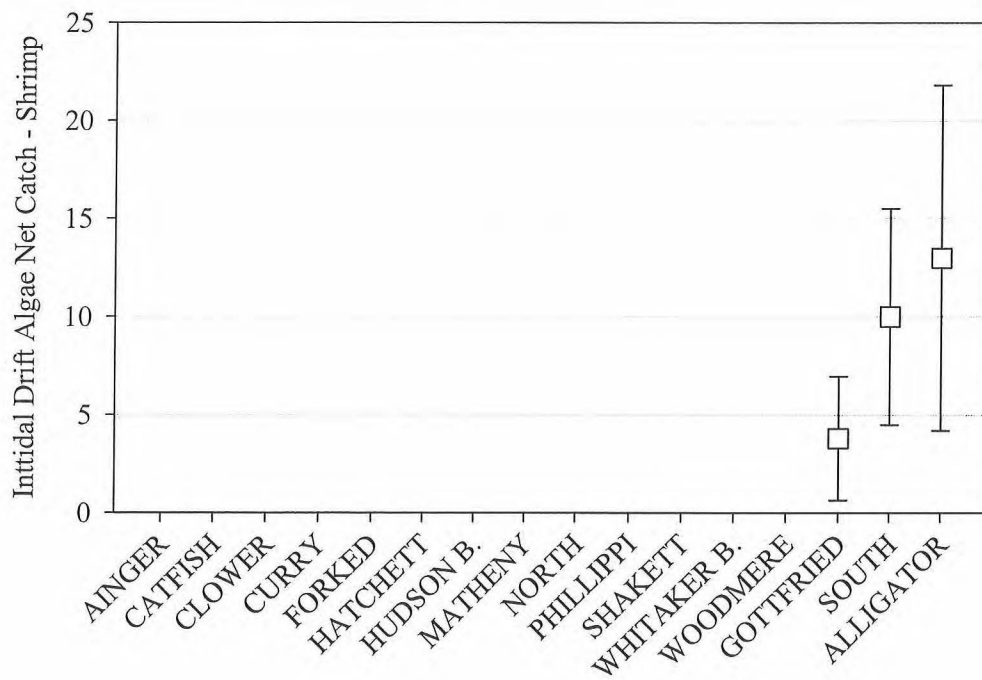
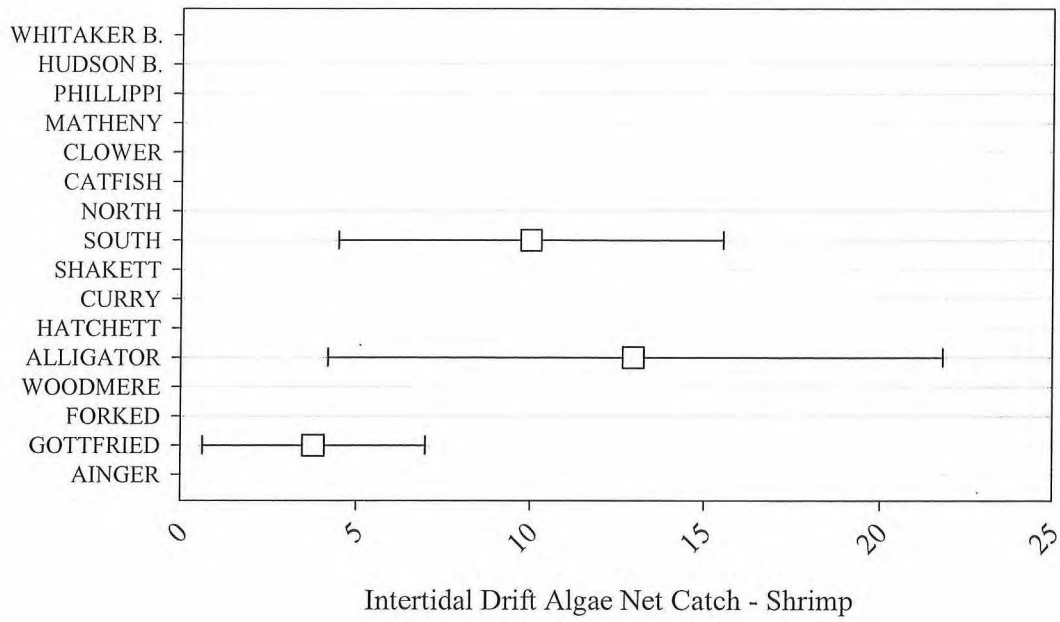
Intertidal Drift Algae Net Catch - Other



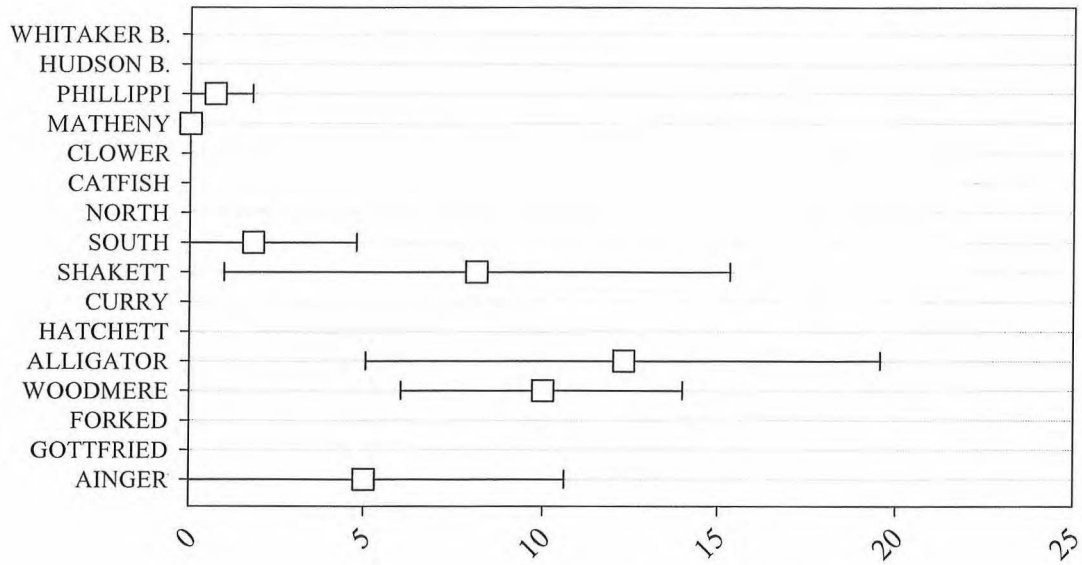
Subtidal Drift Algae Net Catch - OTHER



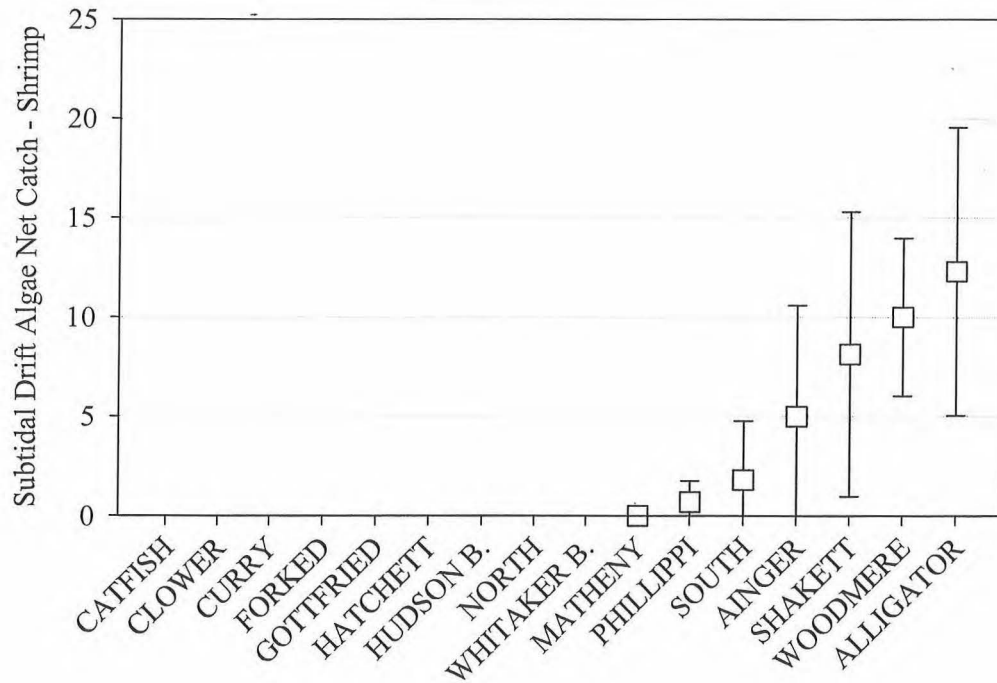
Intertidal Drift Algae Net Catch - SHRIMP



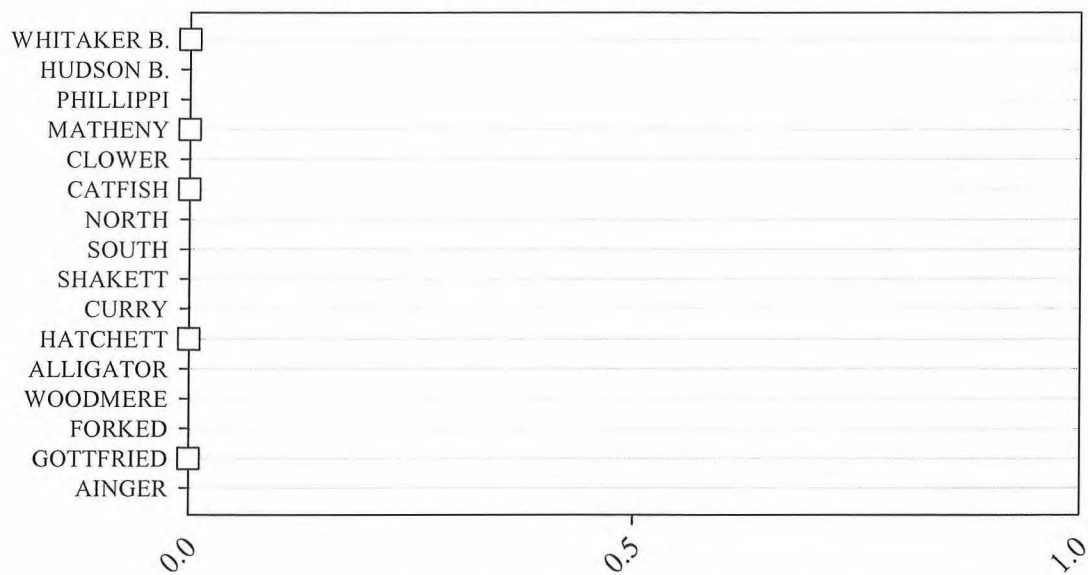
Subtidal Drift Algae Net Catch - SHRIMP



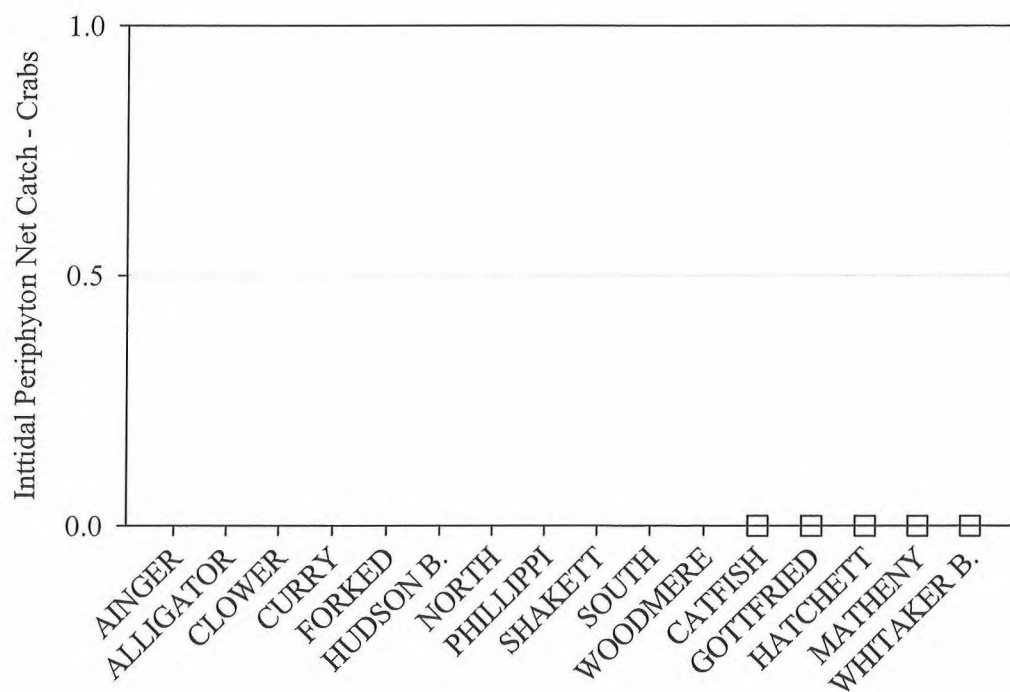
Subtidal Drift Algae Net Catch - Shrimp



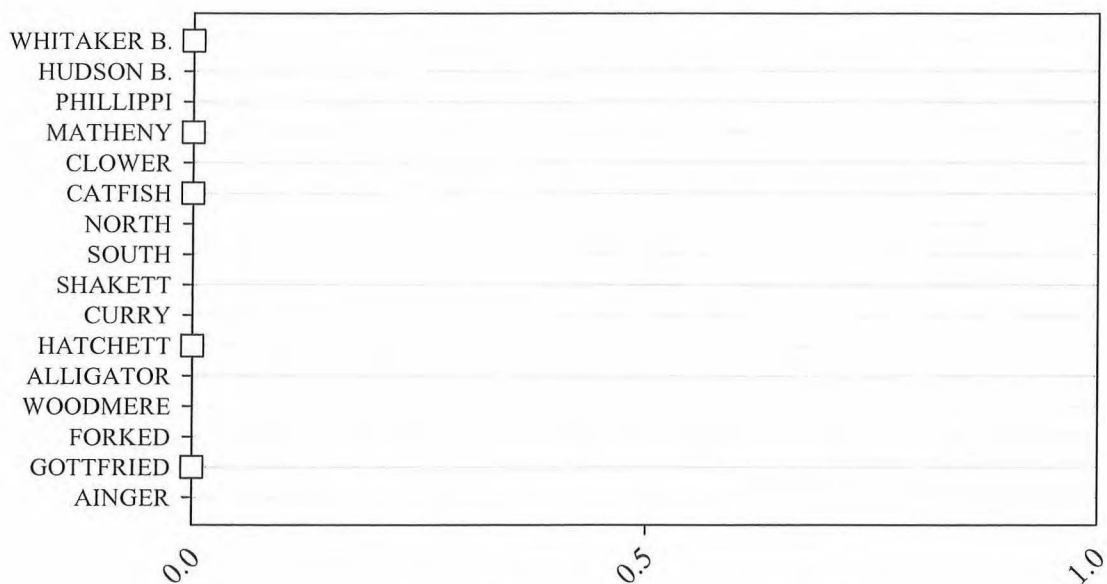
Intertidal Periphyton Net Catch - CRABS



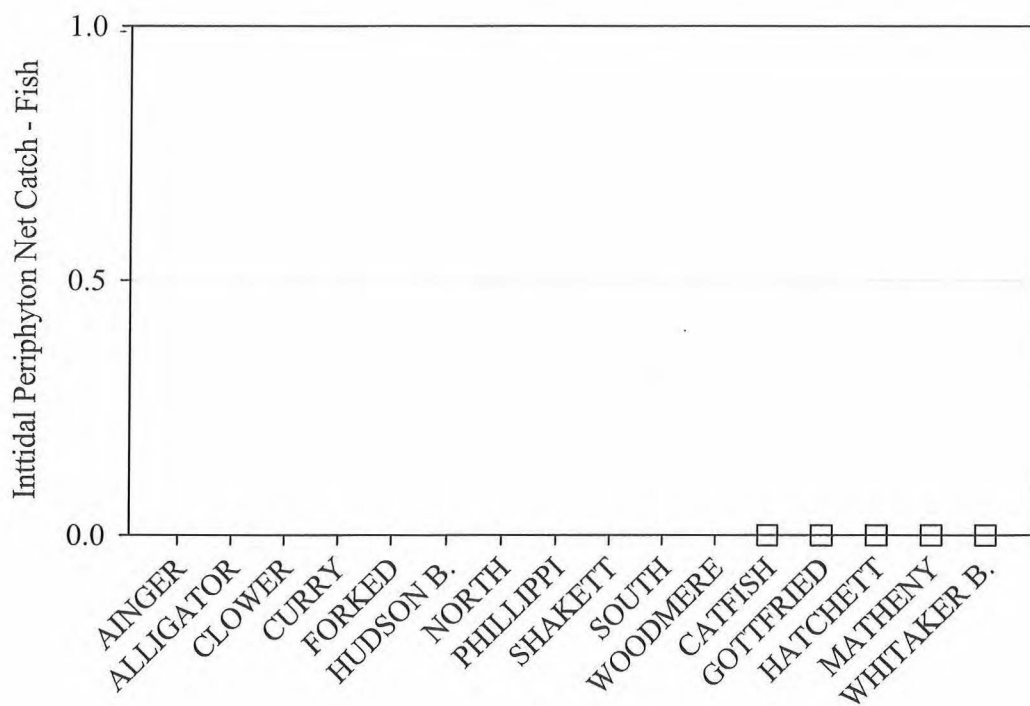
Intertidal Periphyton Net Catch - Crabs



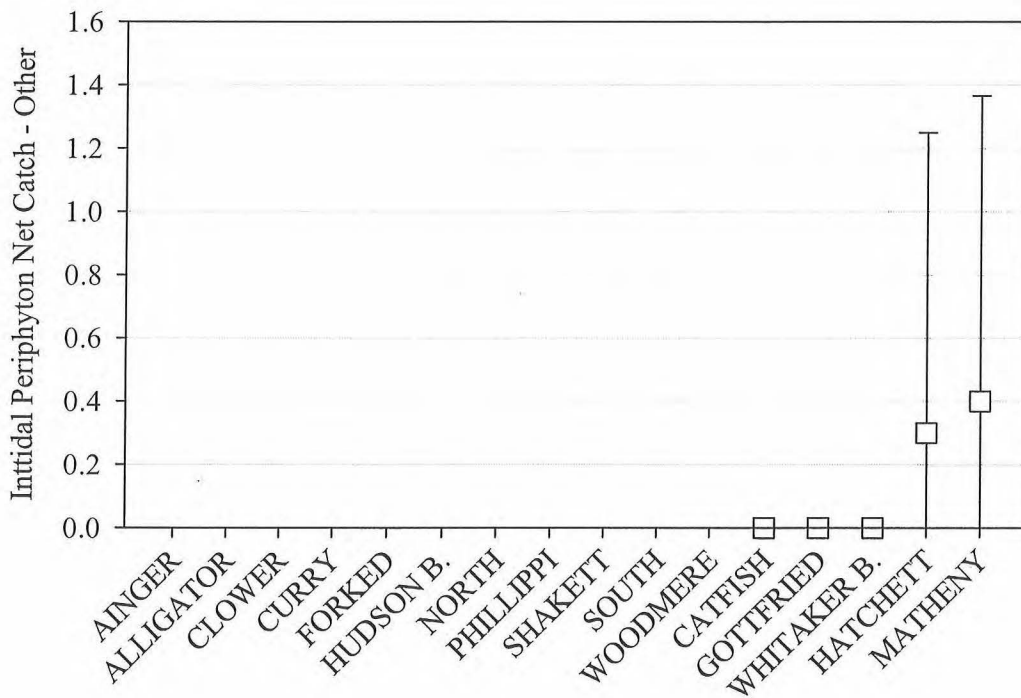
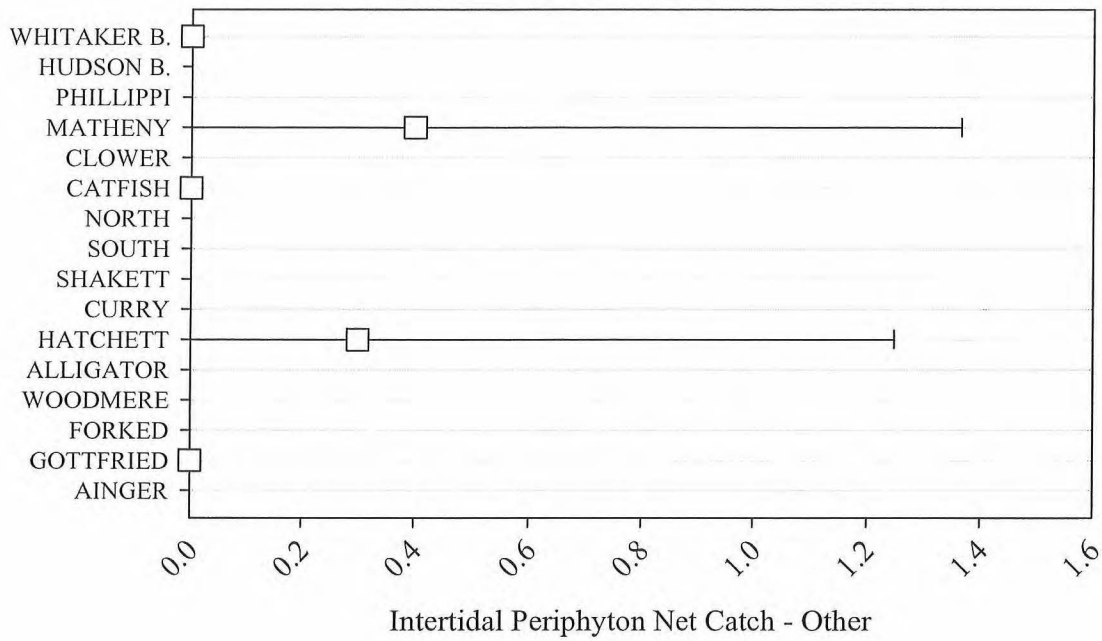
Intertidal Periphyton Net Catch - FISH



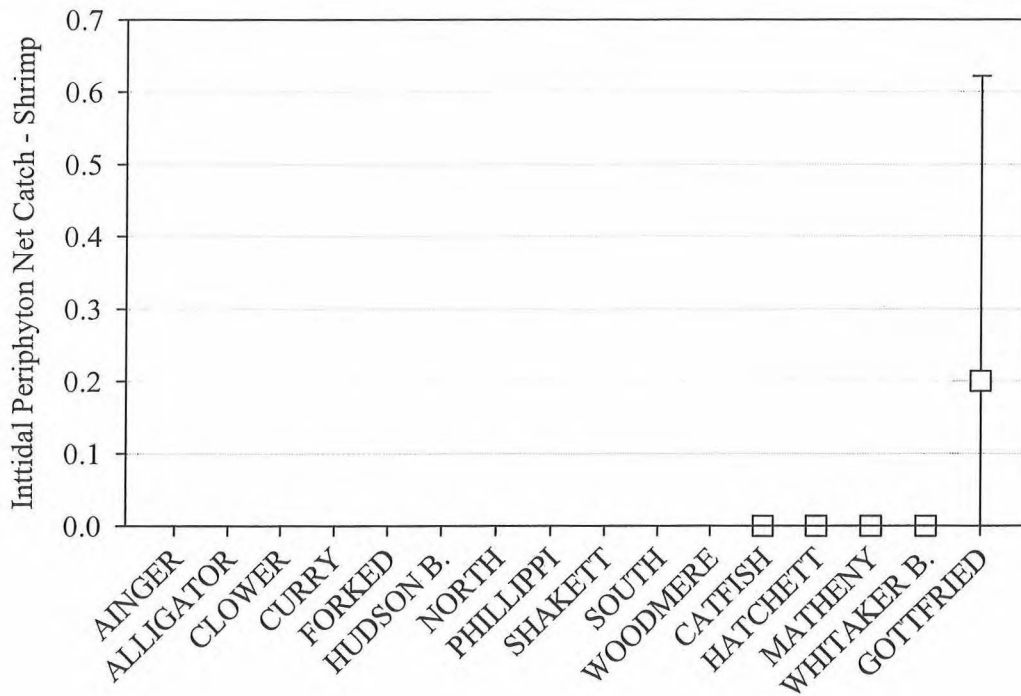
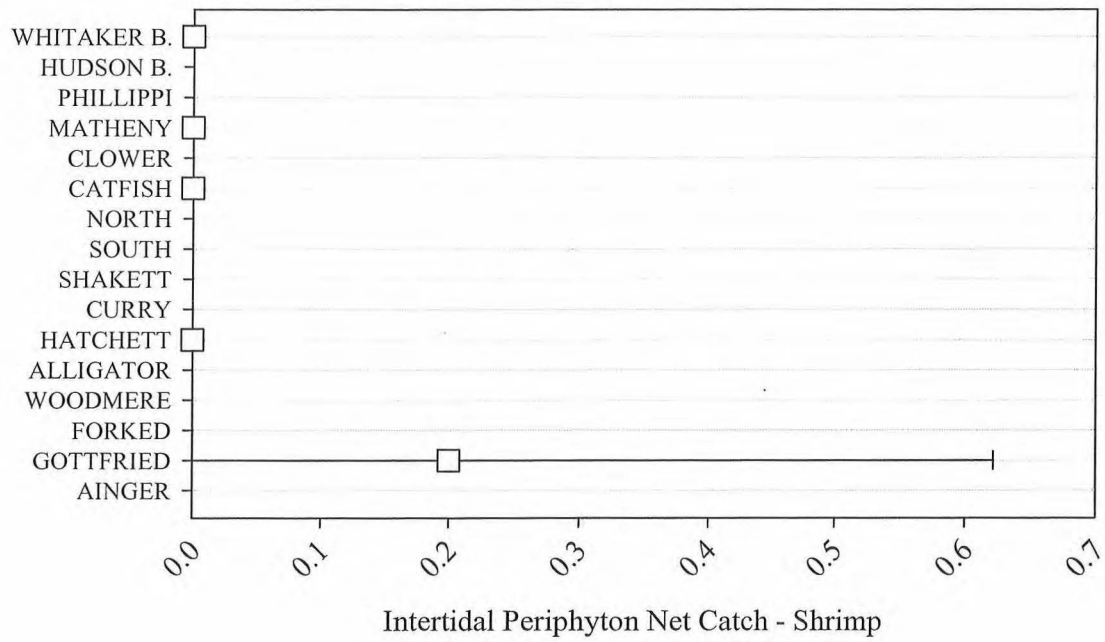
Intertidal Periphyton Net Catch - Fish



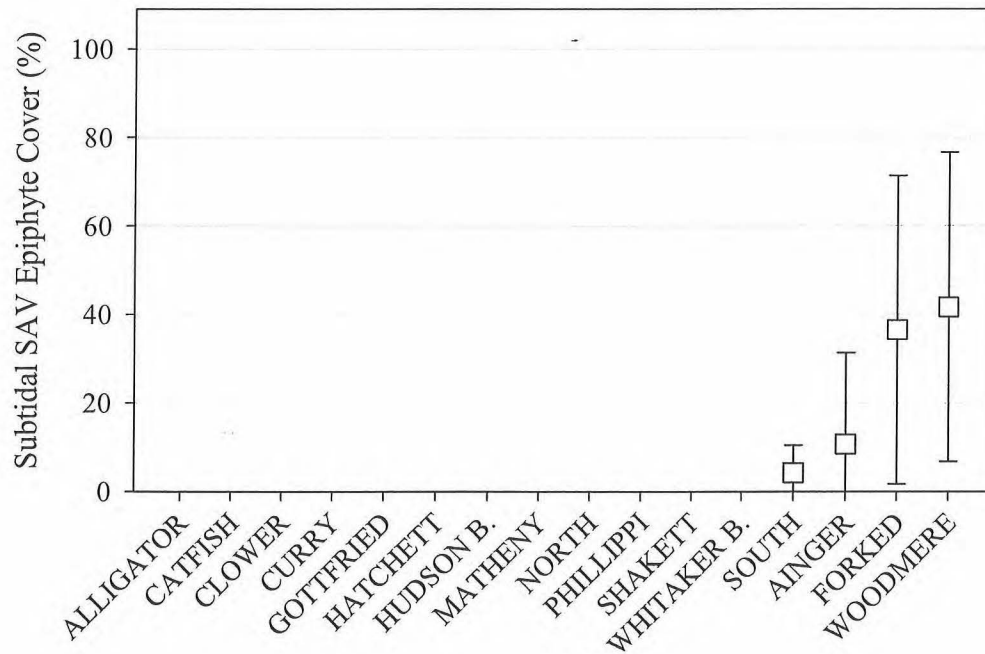
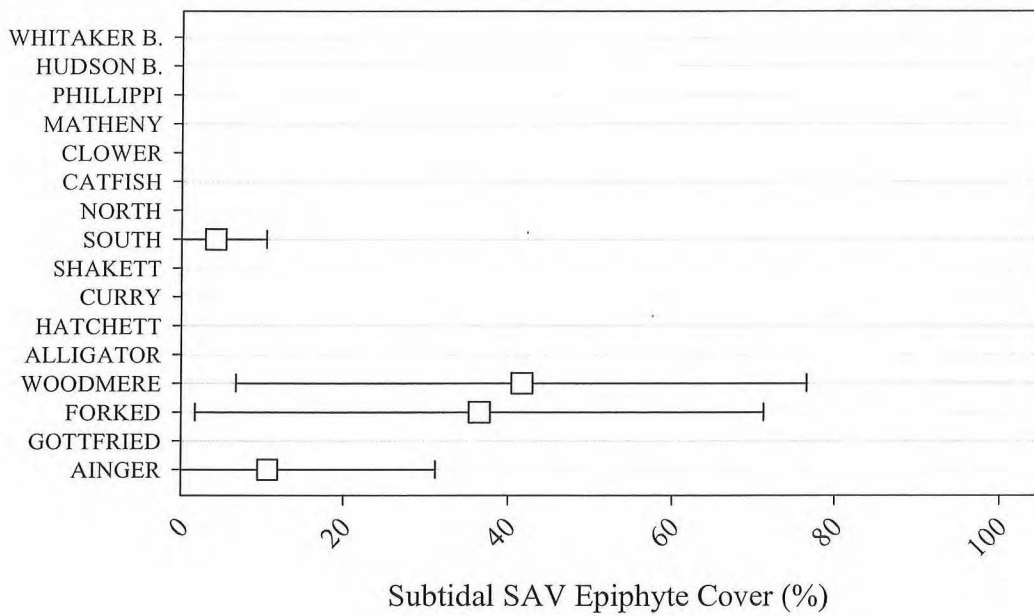
Intertidal Periphyton Net Catch - OTHER



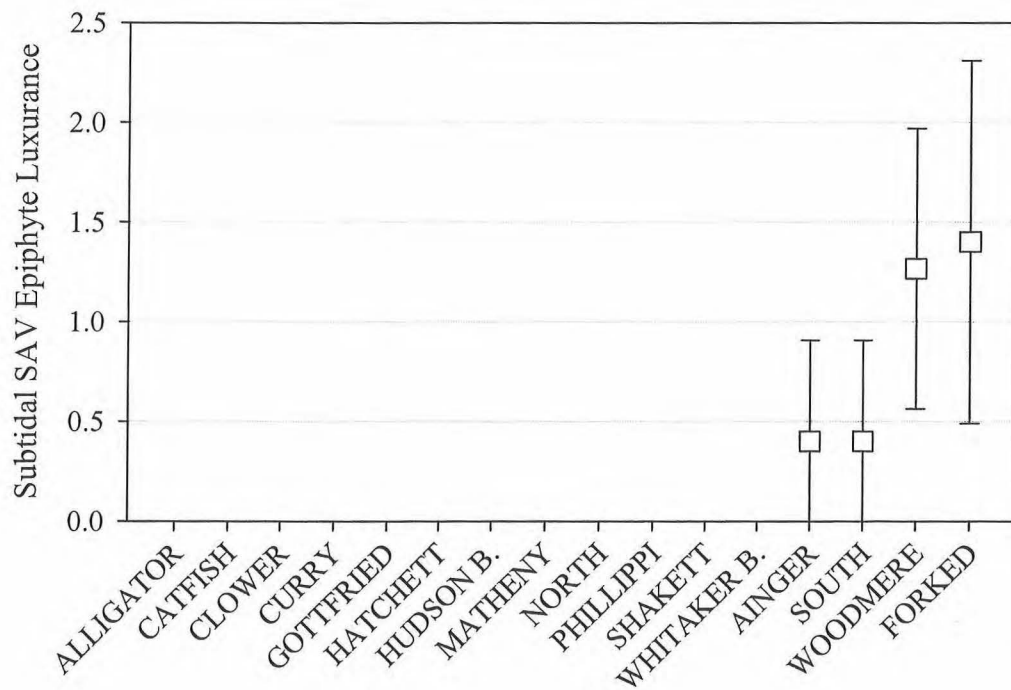
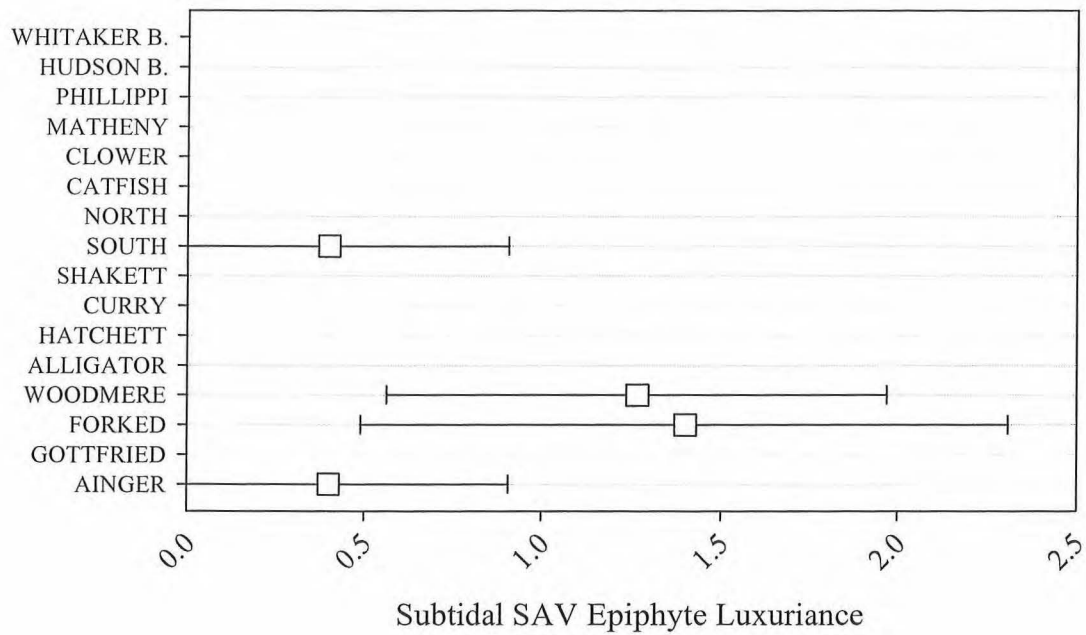
Intertidal Periphyton Net Catch - SHRIMP



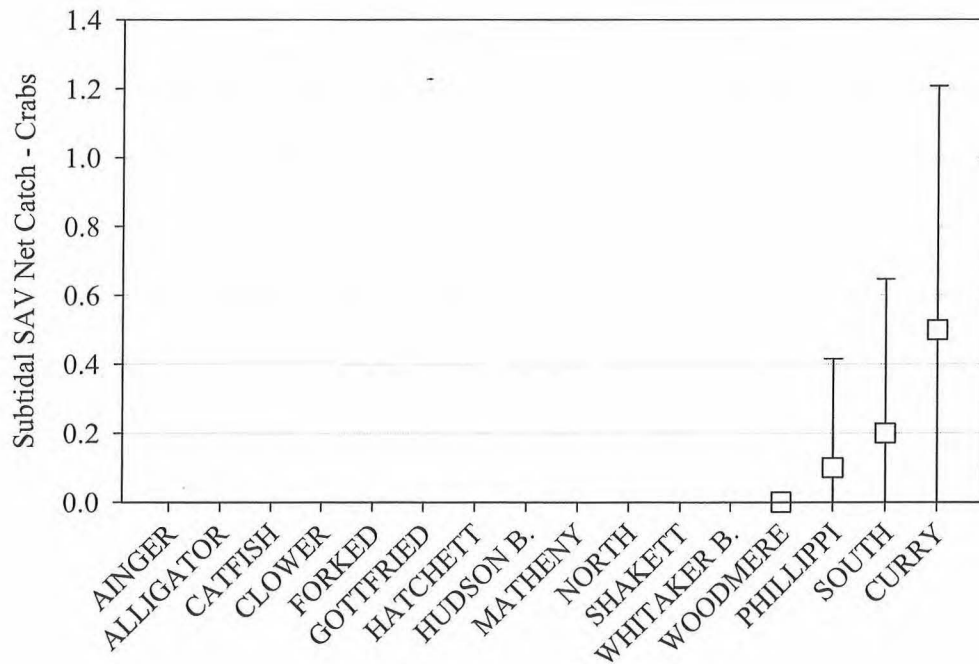
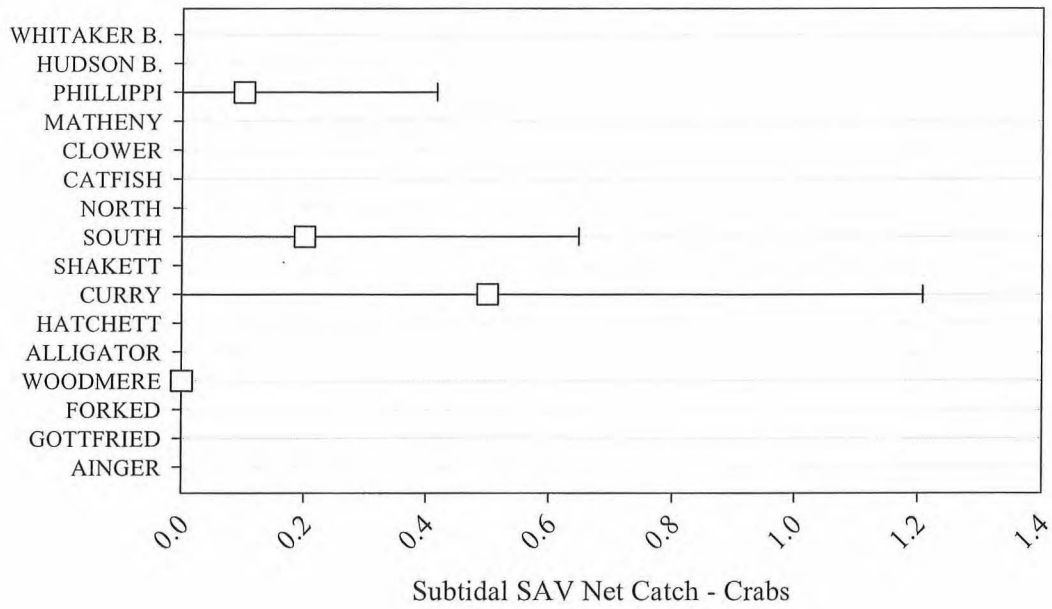
Subtidal SAV Epiphyte Cover (%)



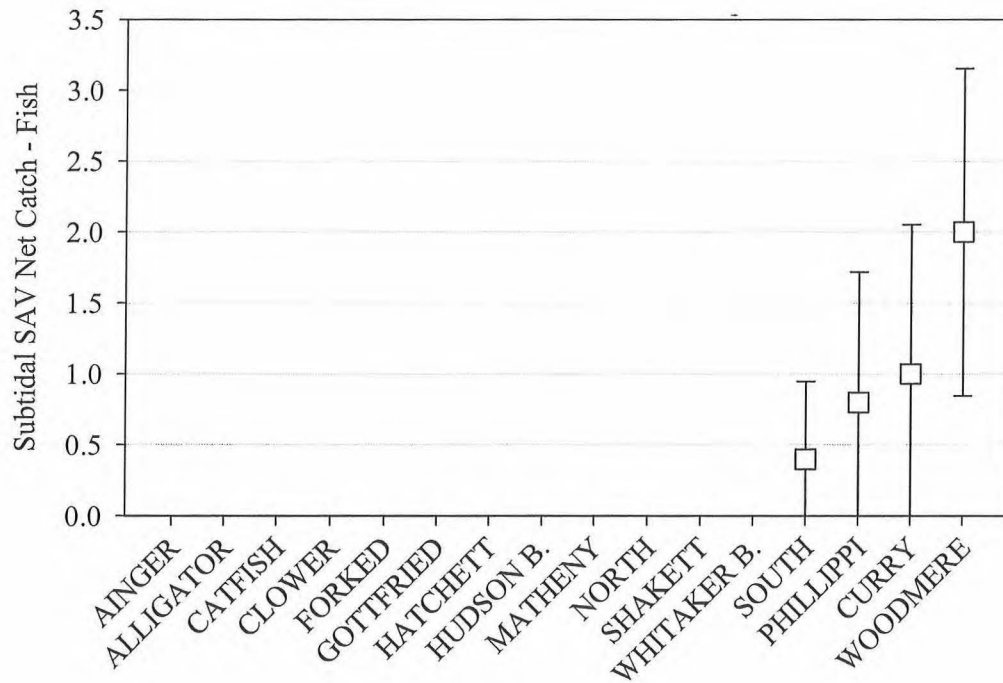
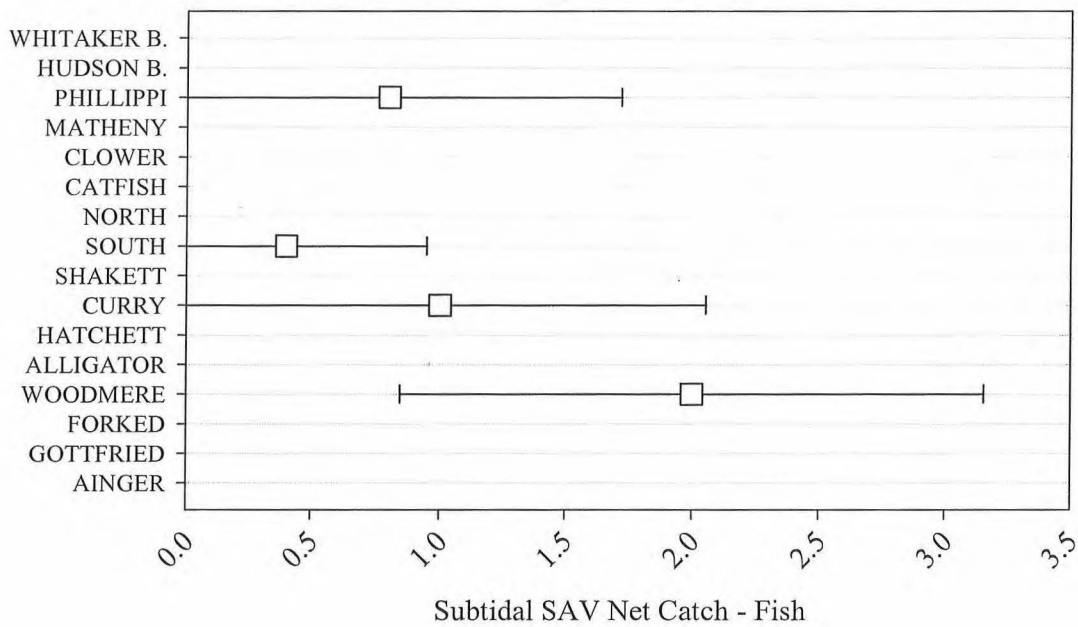
Subtidal SAV Epiphyte Luxuriance



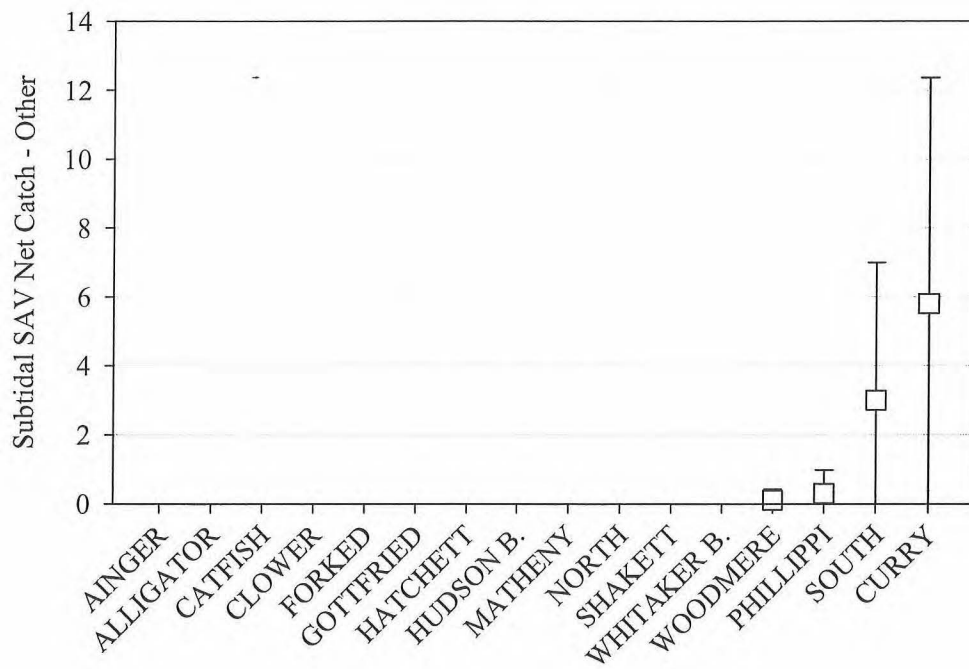
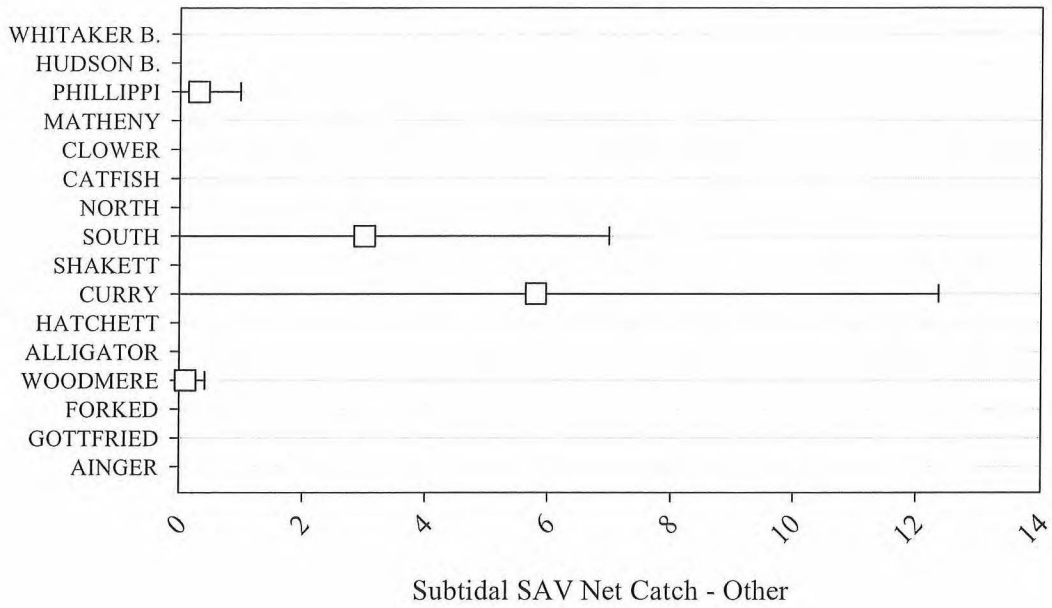
Subtidal SAV Net Catch - CRABS



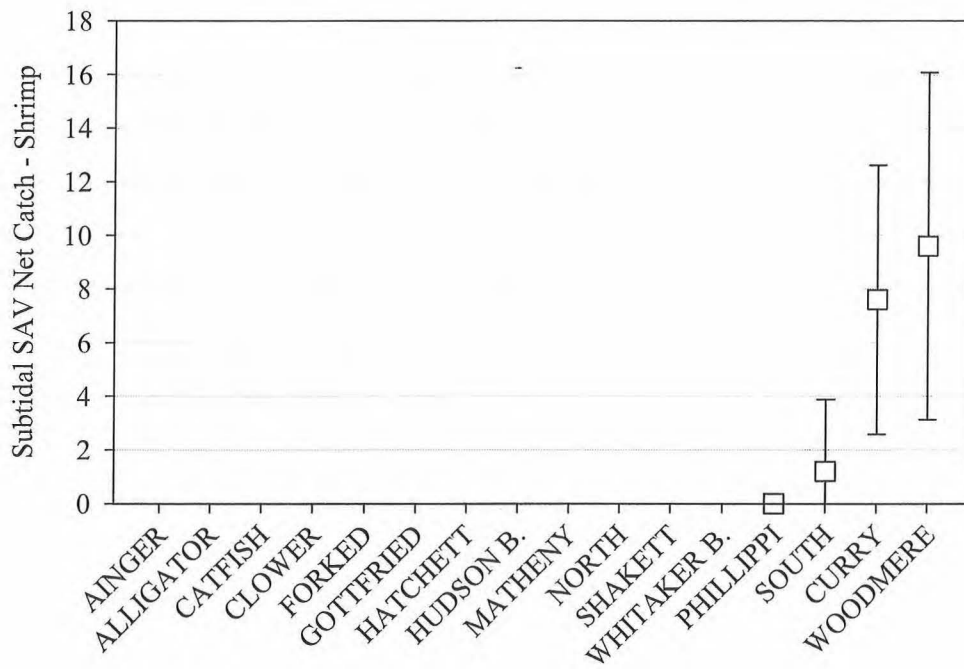
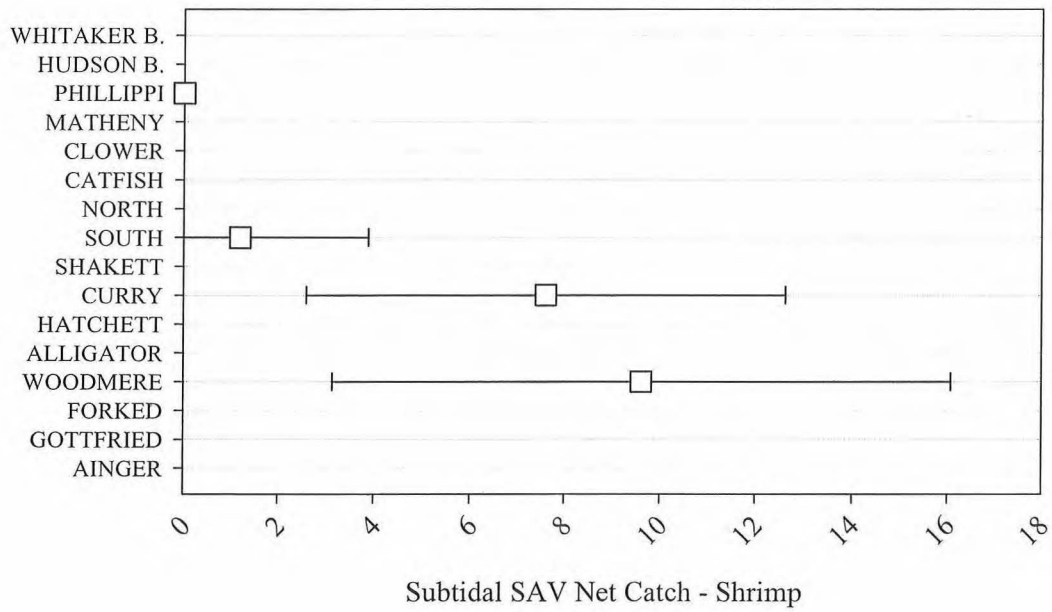
Subtidal SAV Net Catch - FISH



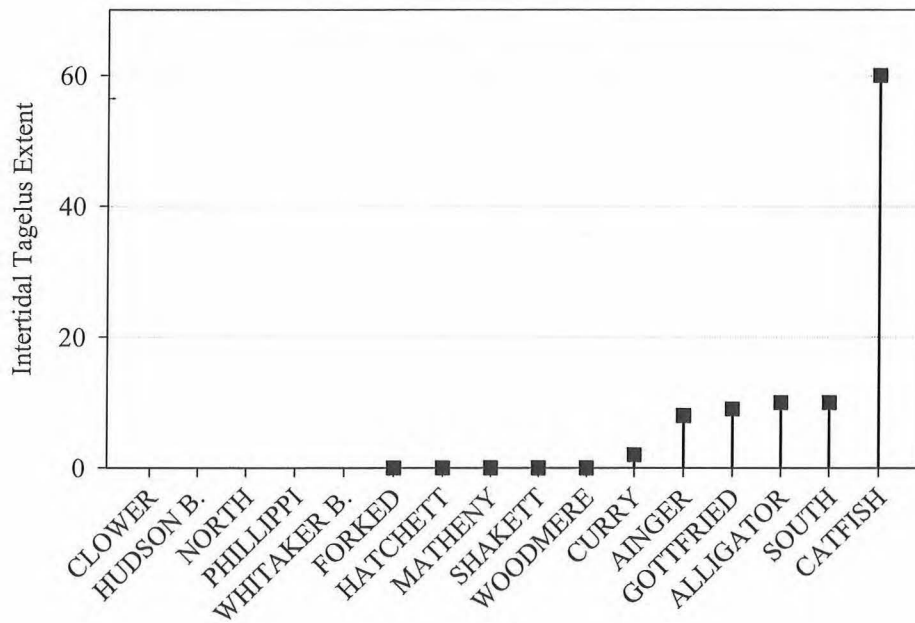
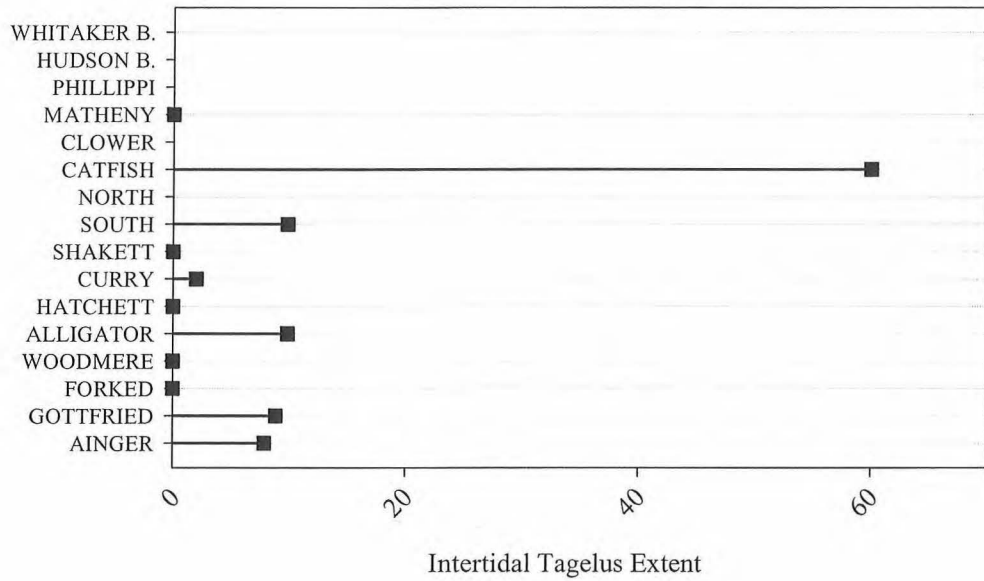
Subtidal SAV Net Catch - OTHER



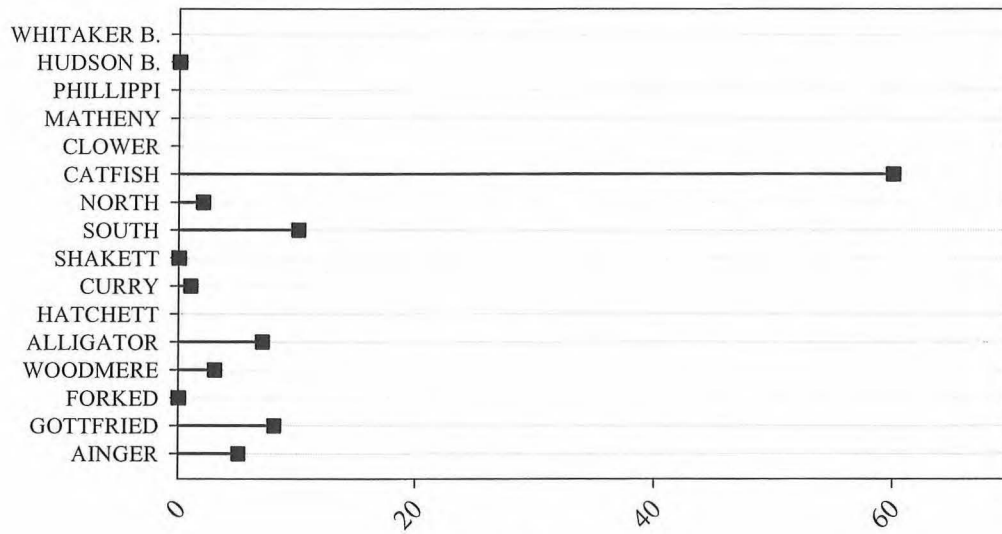
Subtidal SAV Net Catch - SHRIMP



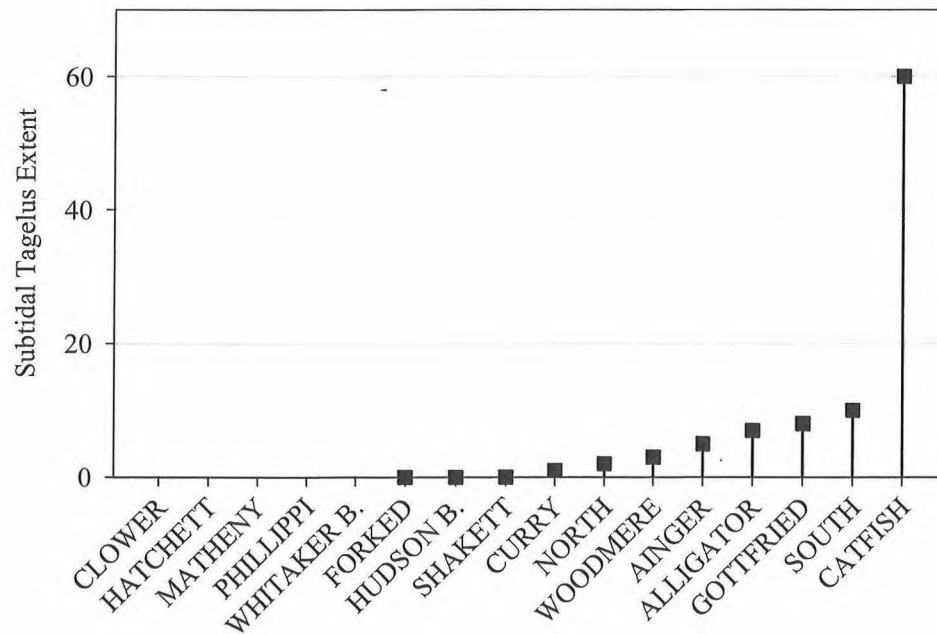
Intertidal Tagelus Extent



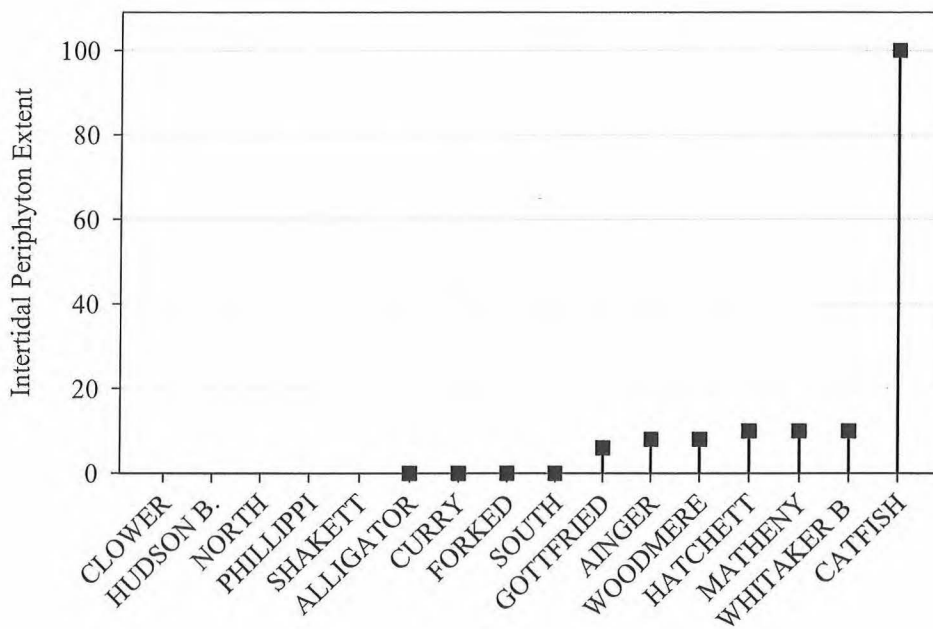
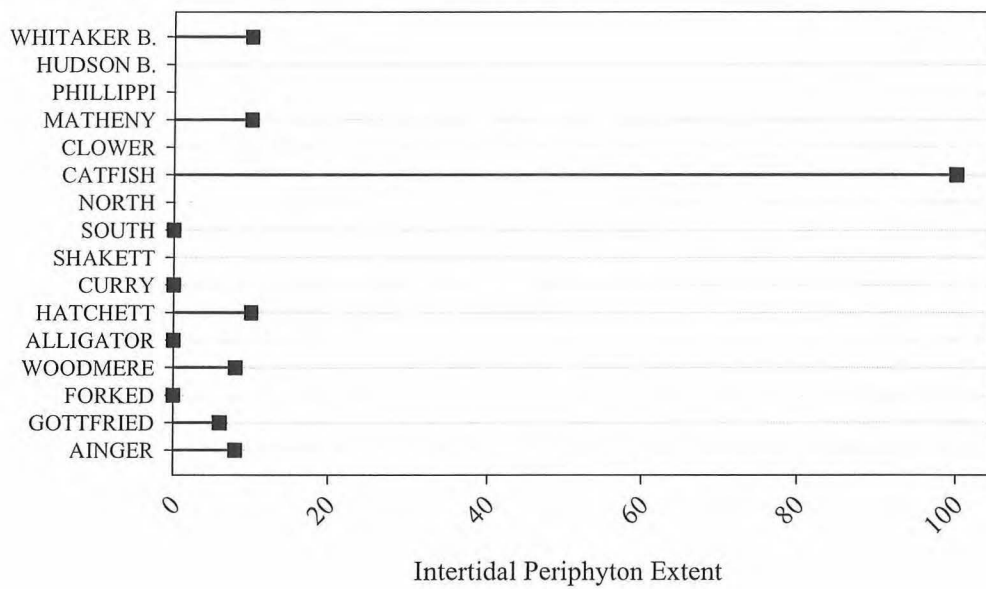
Subtidal Tagelus Extent



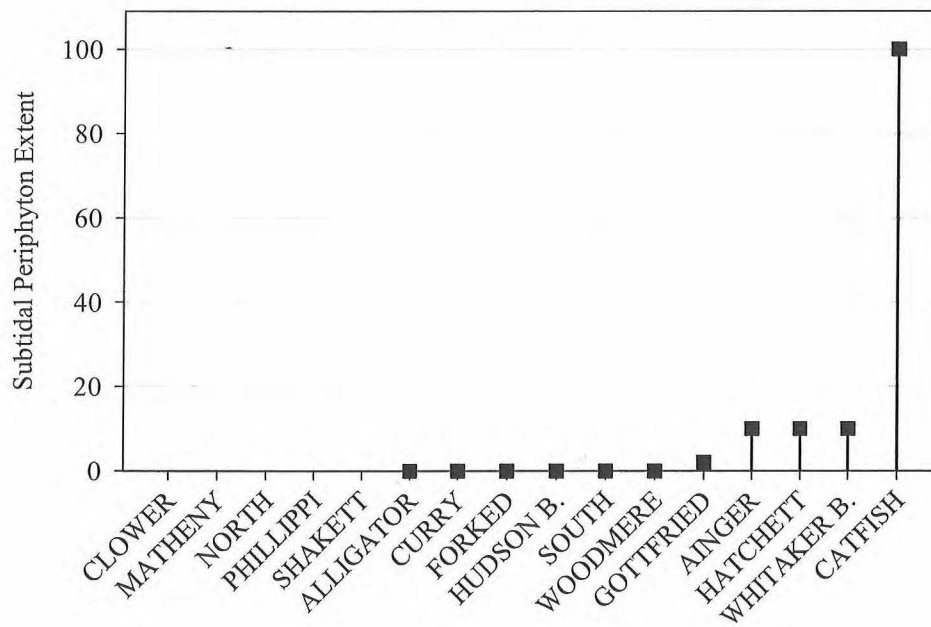
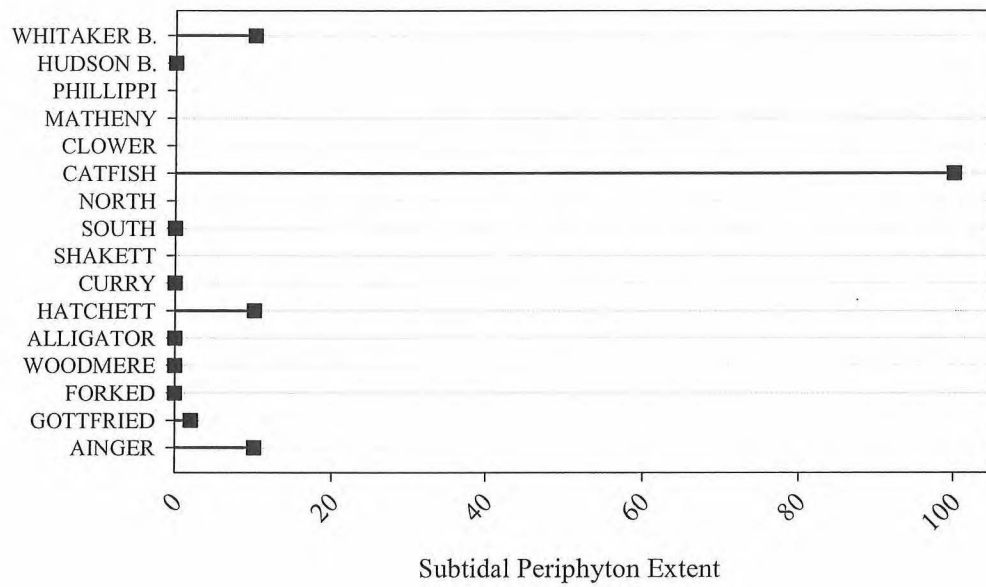
Subtidal Tagelus Extent



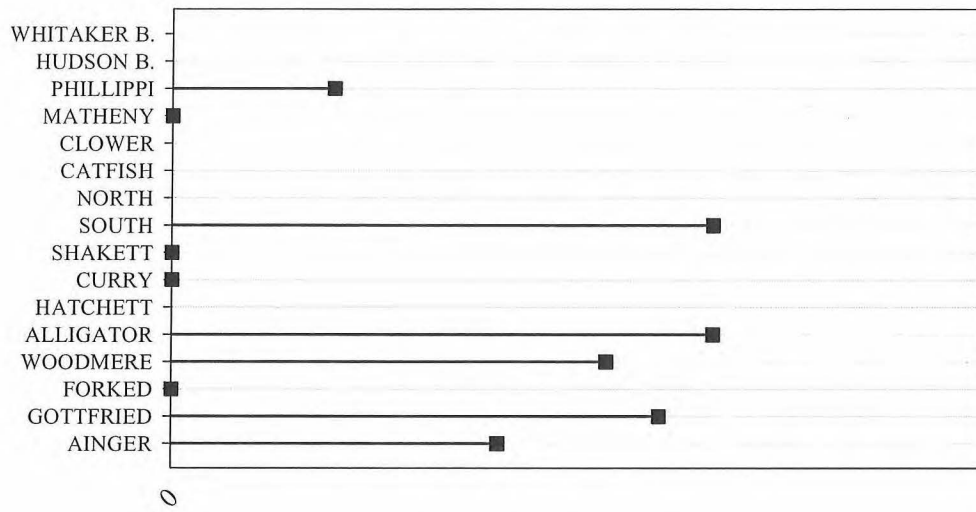
Intertidal Periphyton Extent



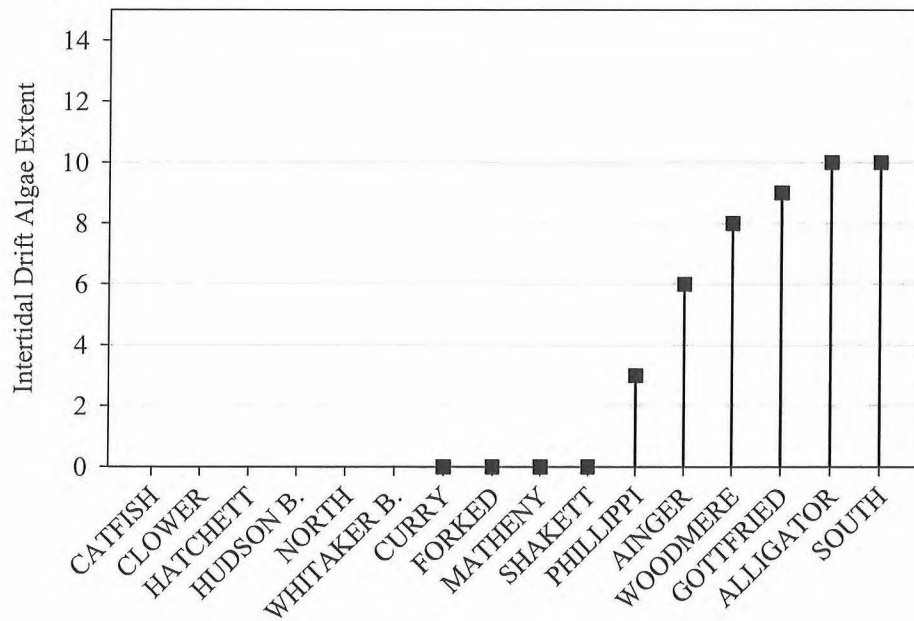
Subtidal Periphyton Extent



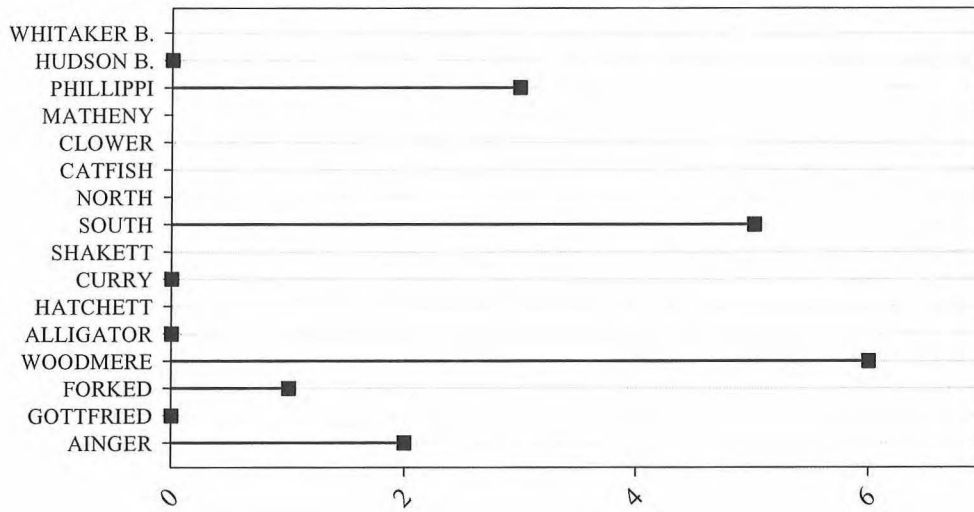
Intertidal Drift Algae Extent



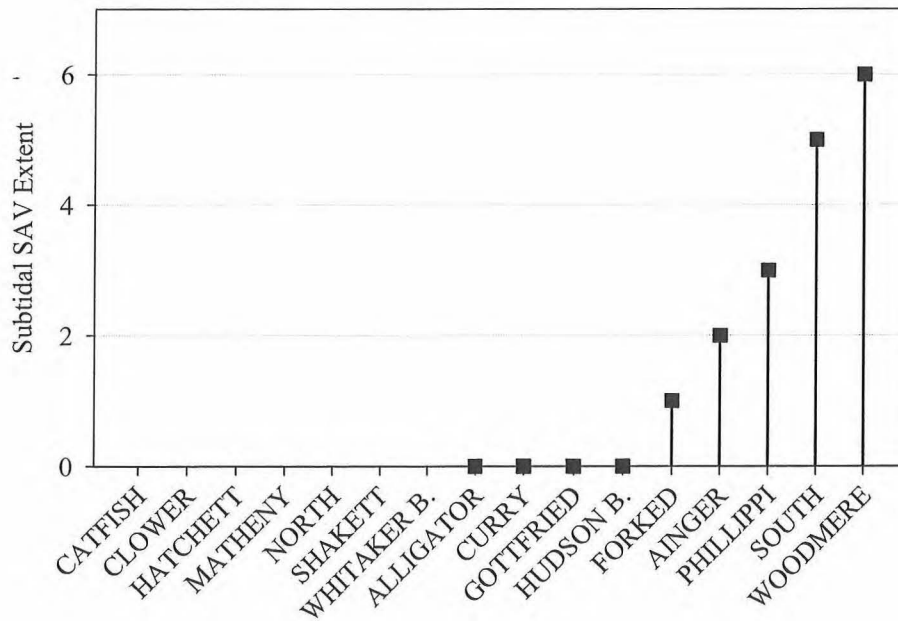
Intertidal Drift Algae Extent



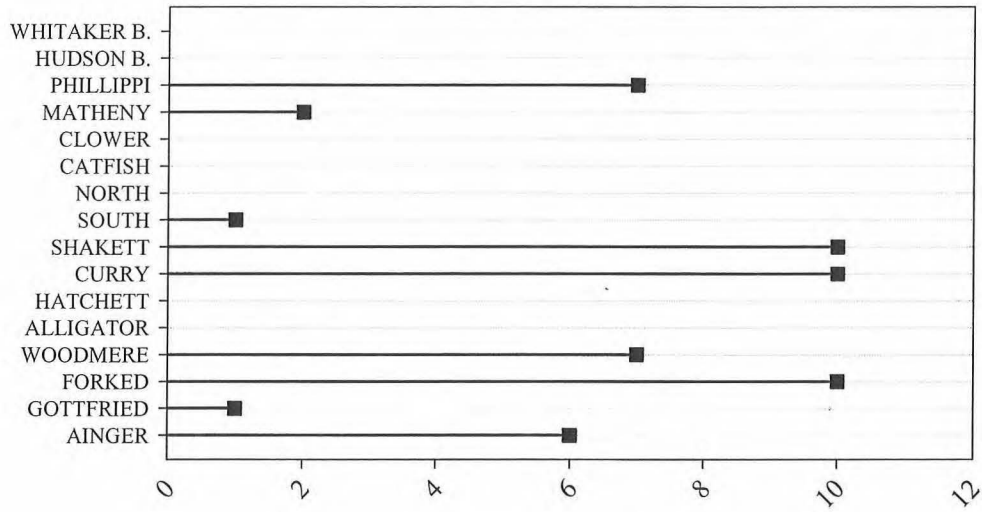
Subtidal SAV Extent



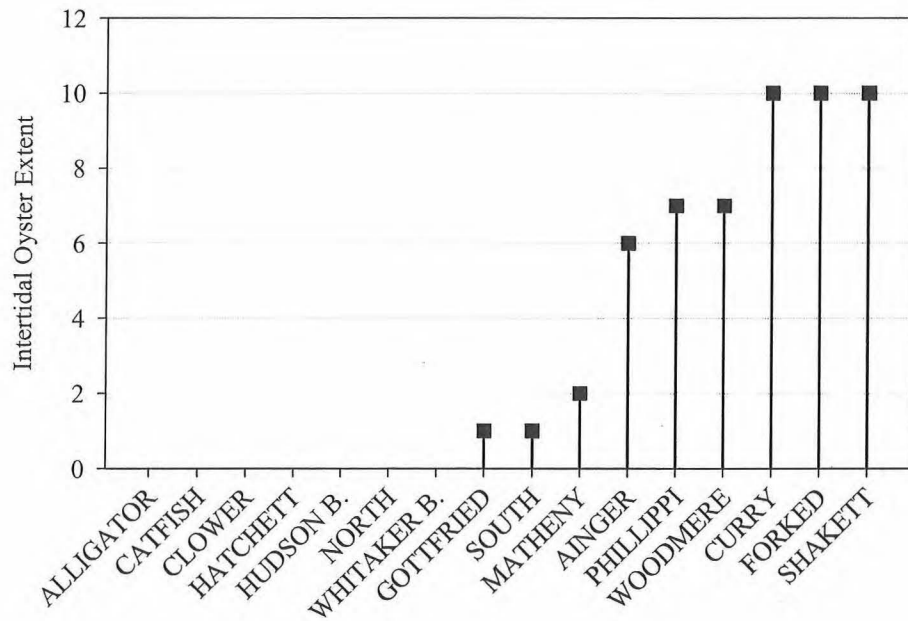
Subtidal SAV Extent



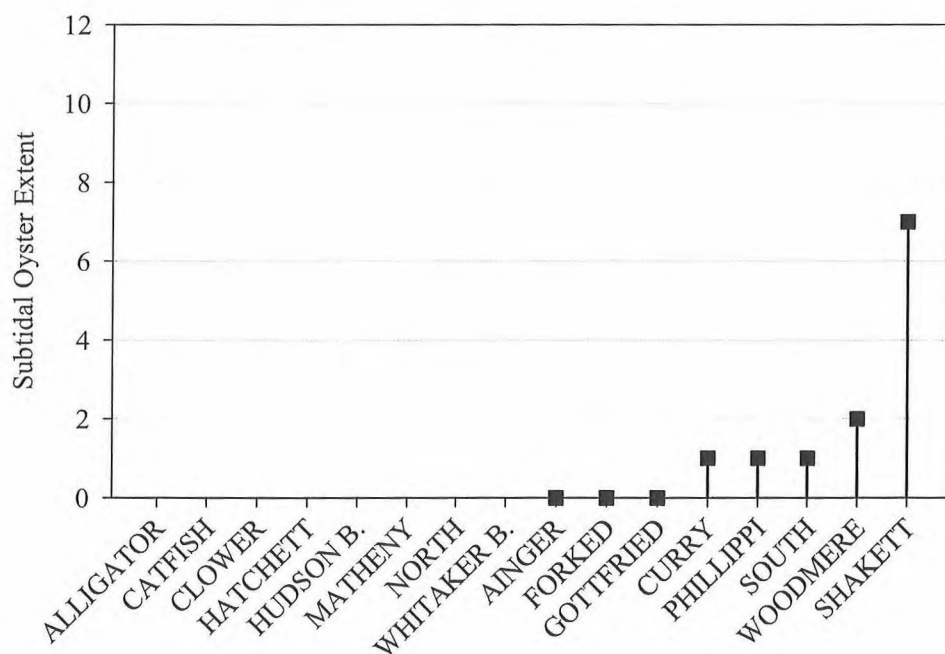
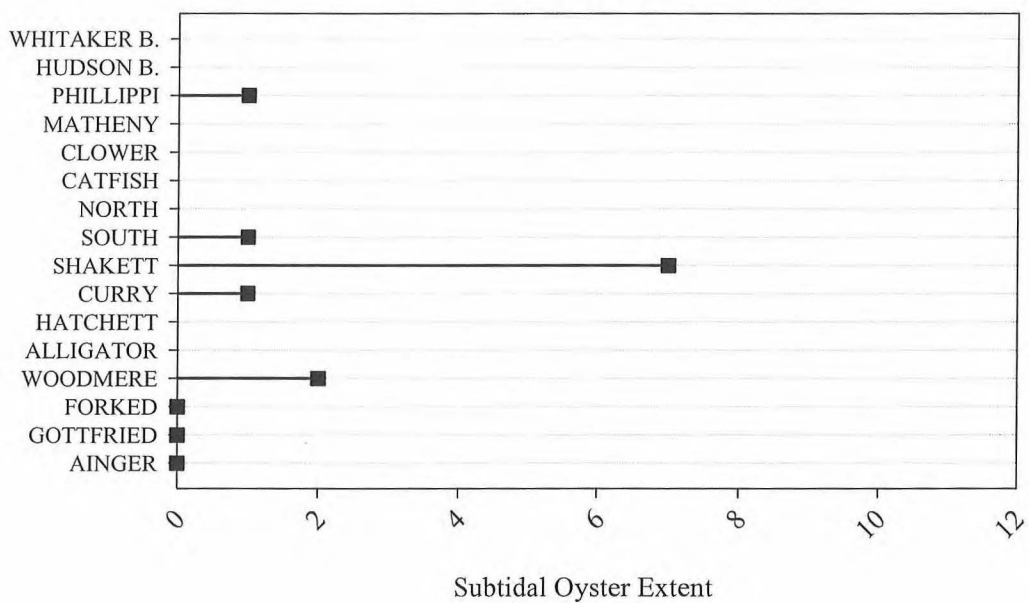
Intertidal Oyster Extent



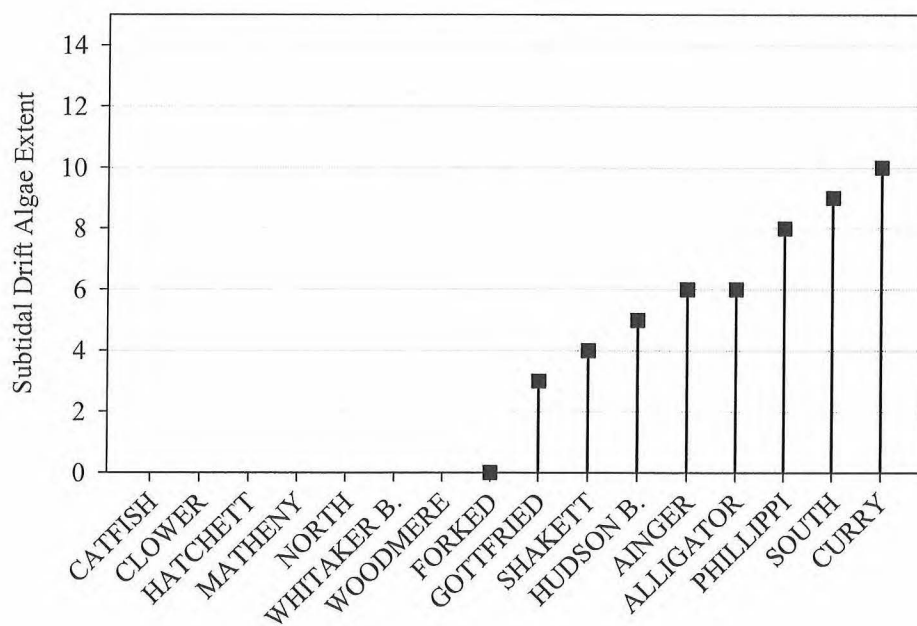
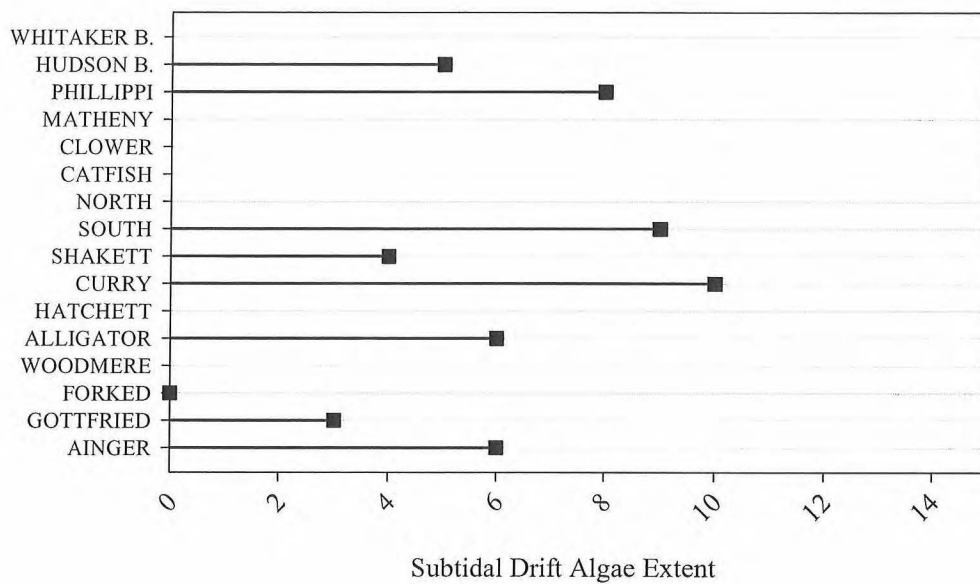
Intertidal Oyster Extent



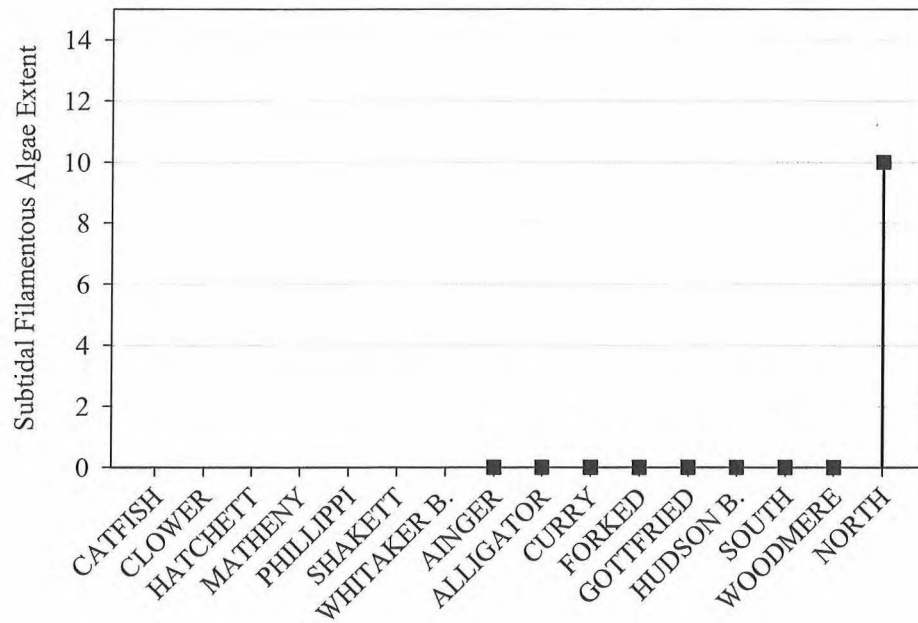
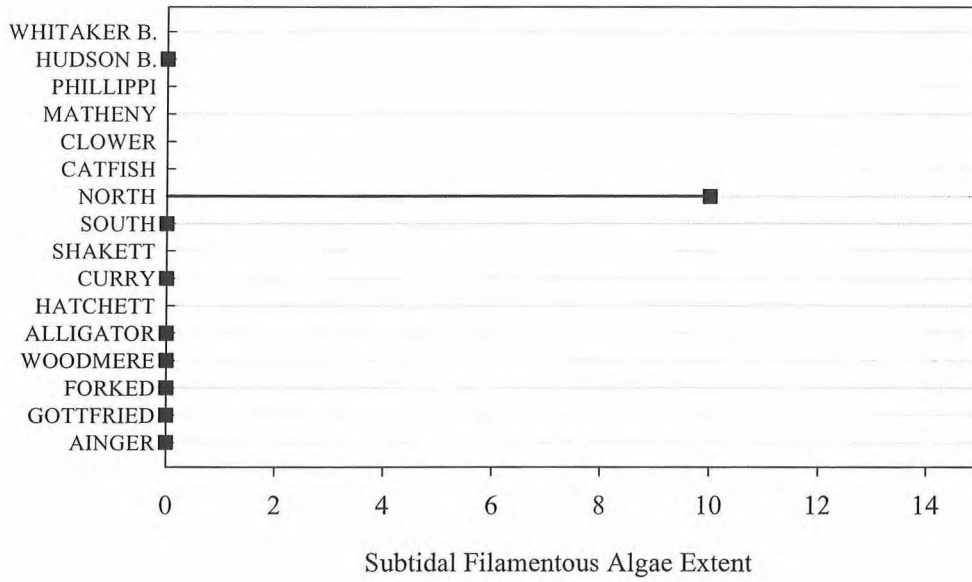
Subtidal Oyster Extent



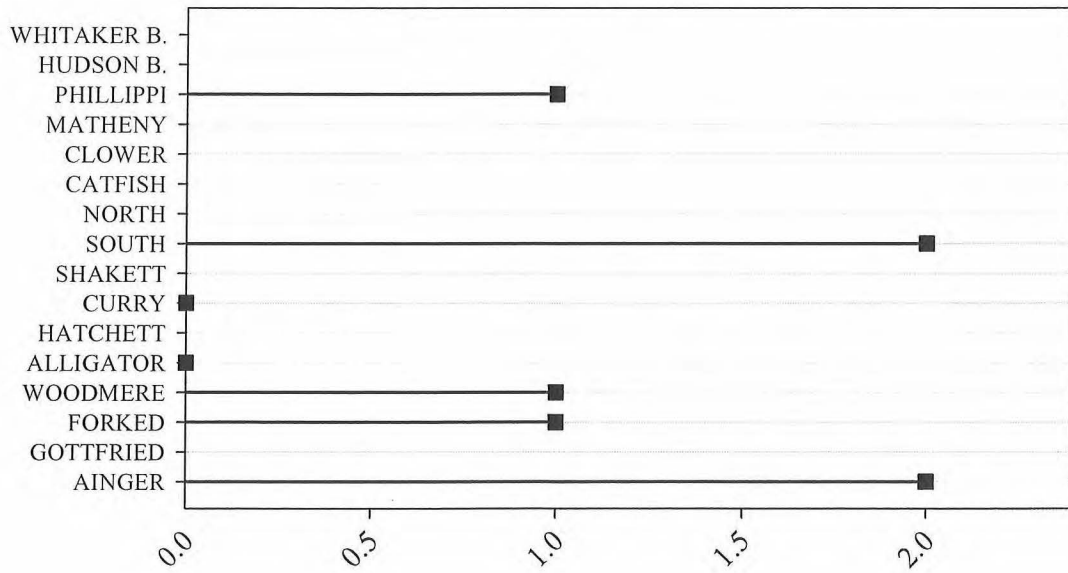
Subtidal Drift Algae Extent



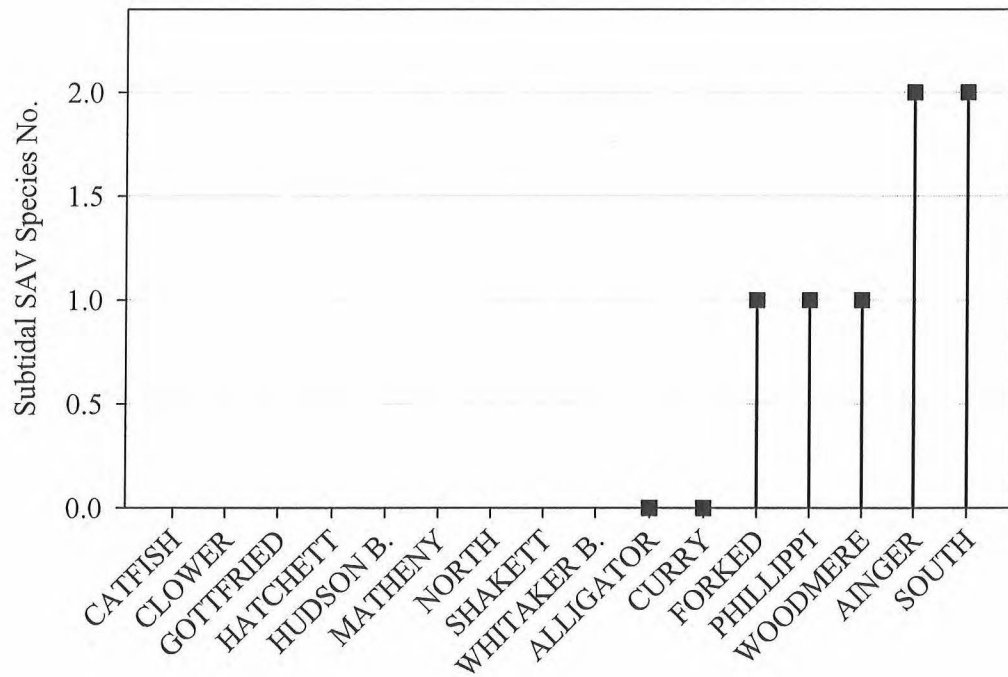
Subtidal Filamentous Algae Extent



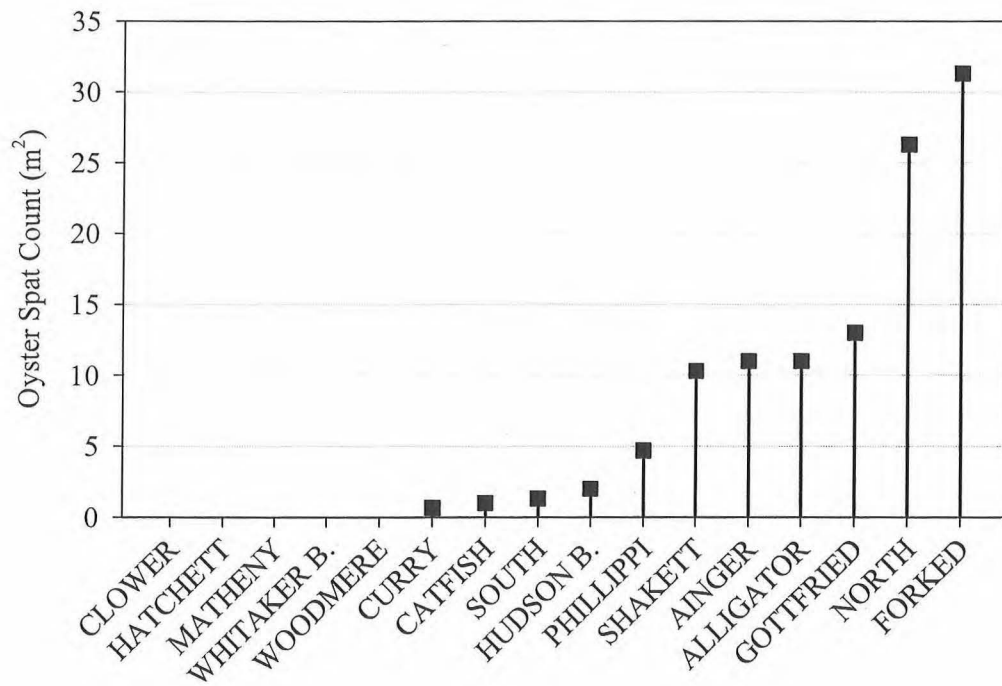
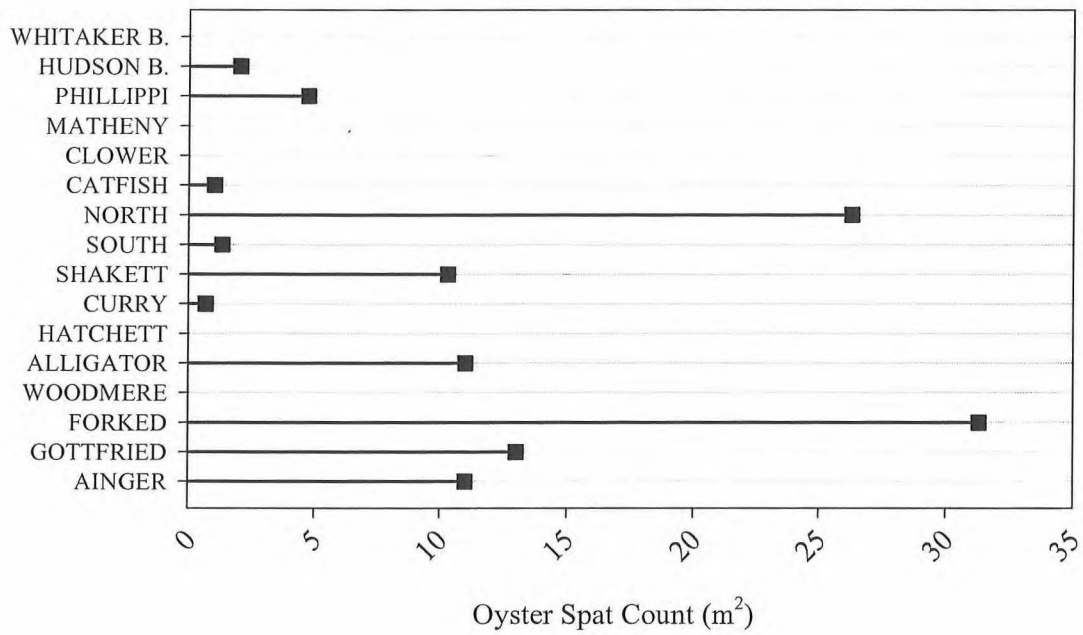
Subtidal SAV Species No.

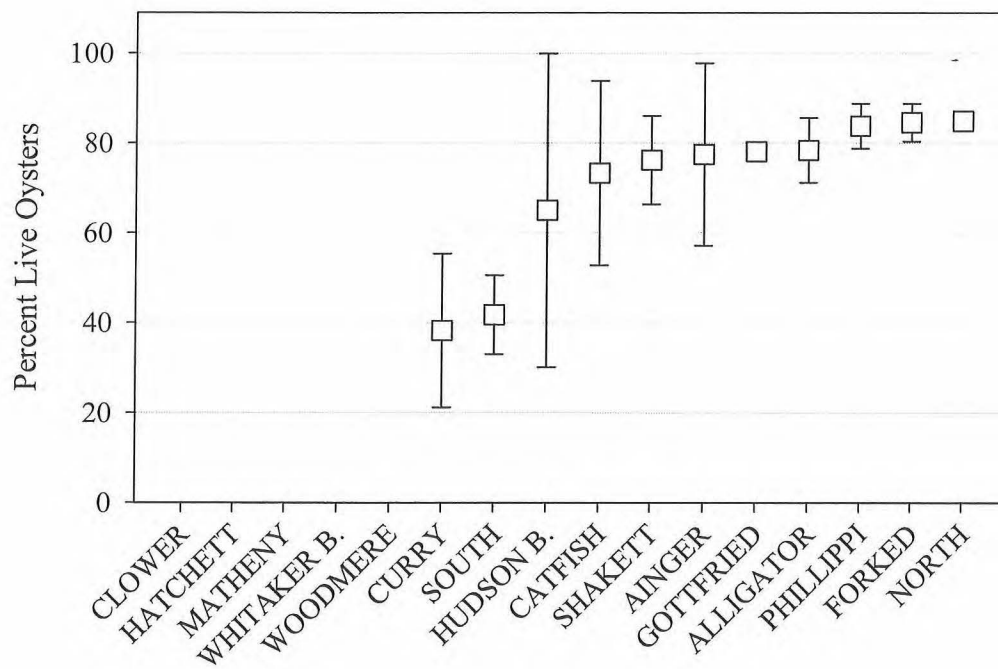
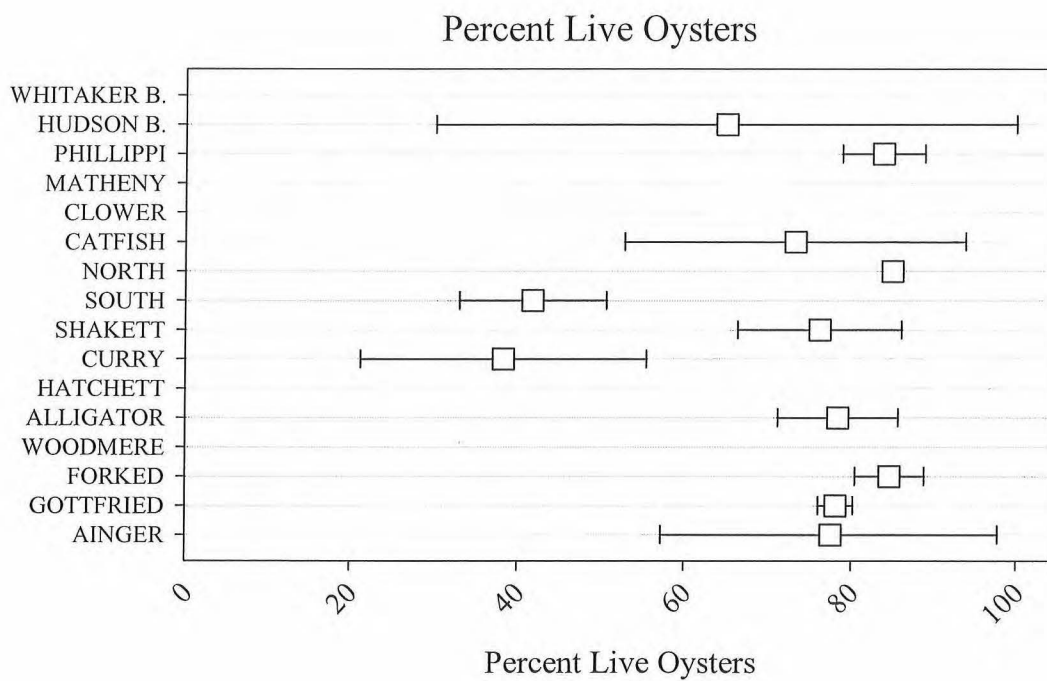


Subtidal SAV Species No.

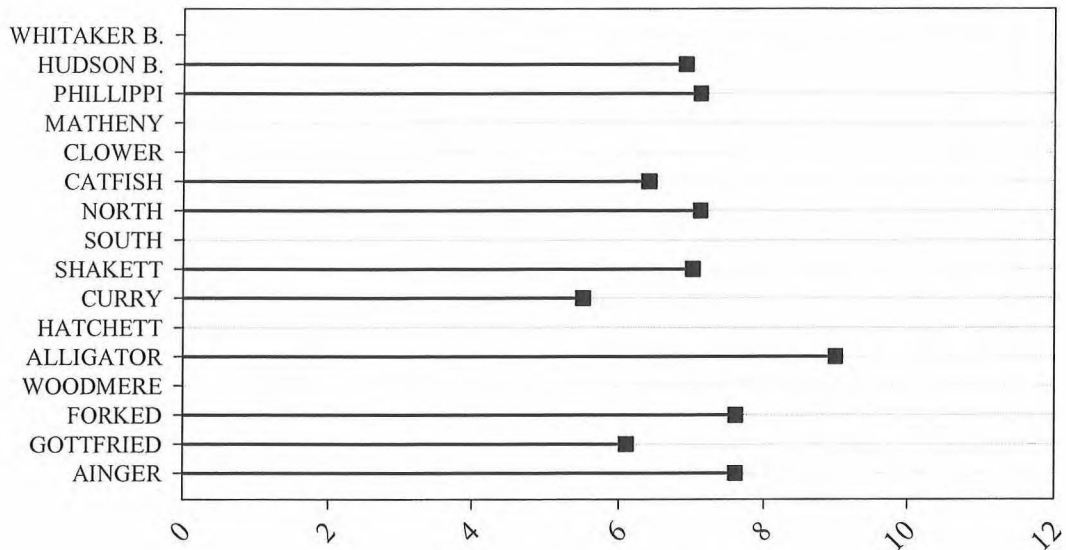


Oyster Spat Count

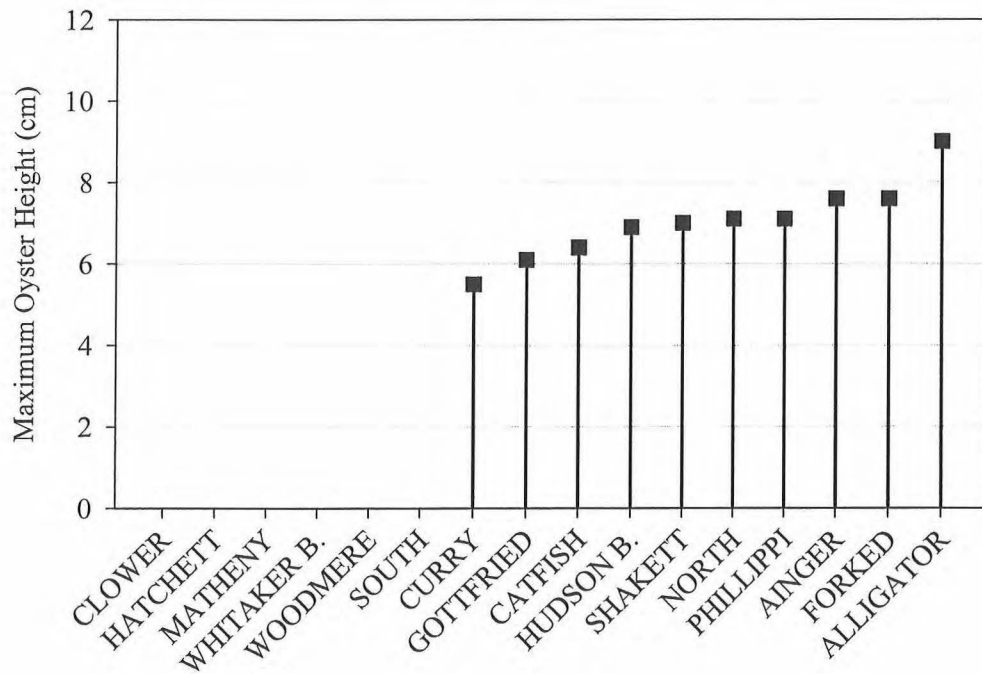




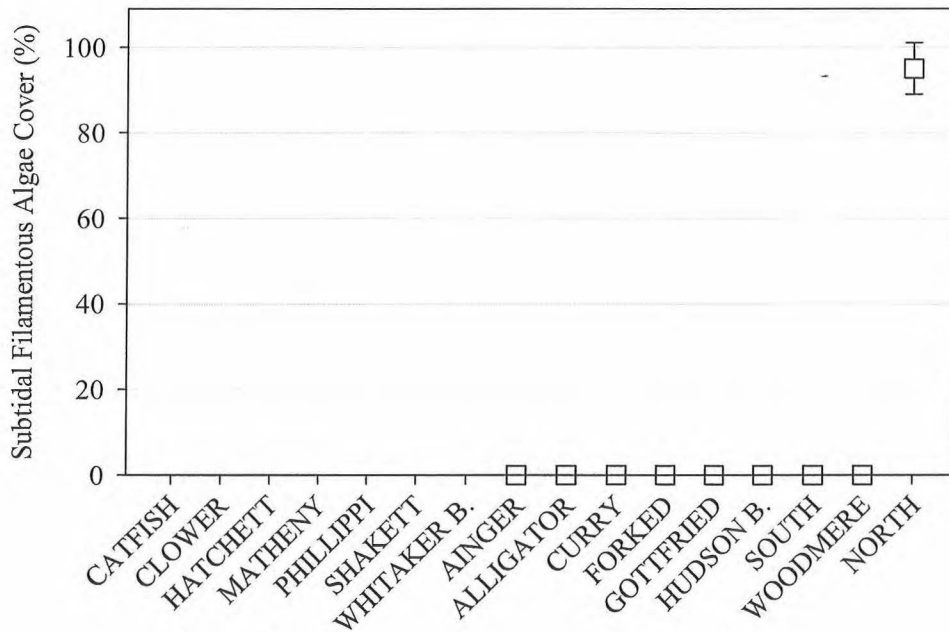
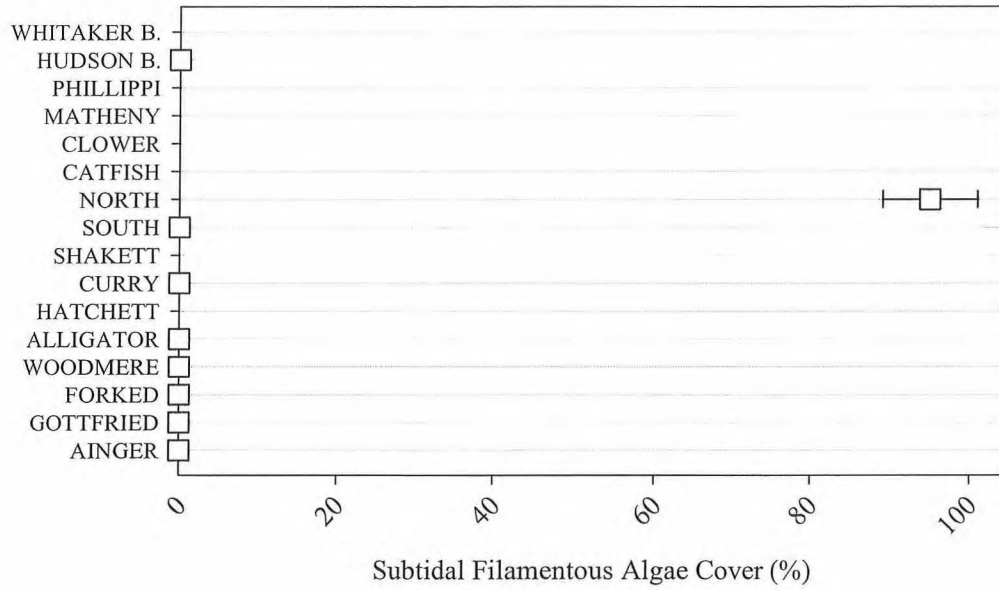
Maximum Oyster Height (cm)



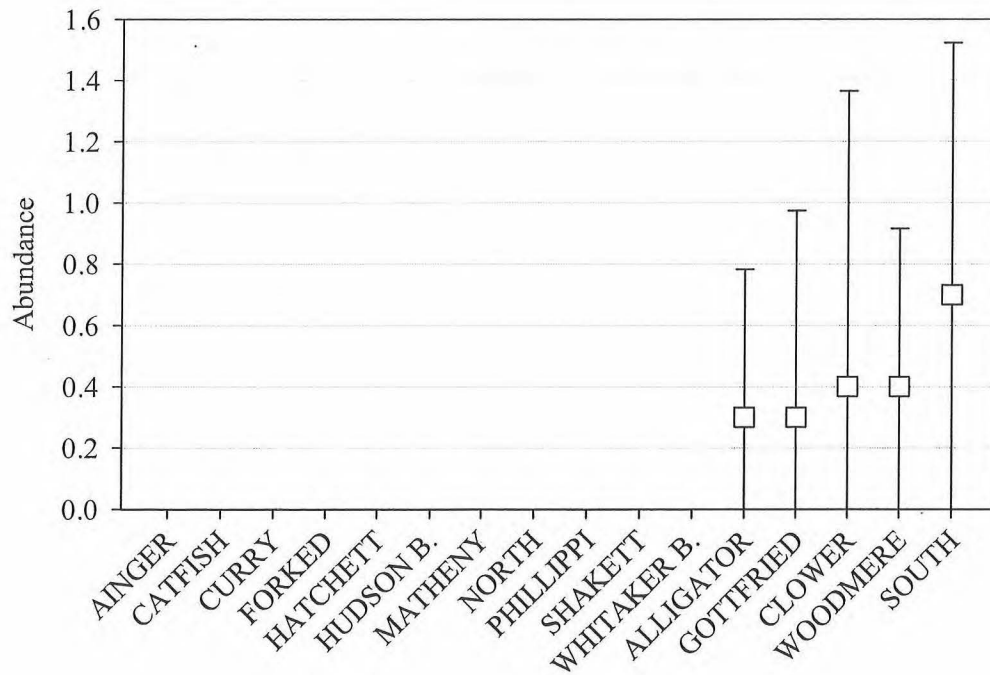
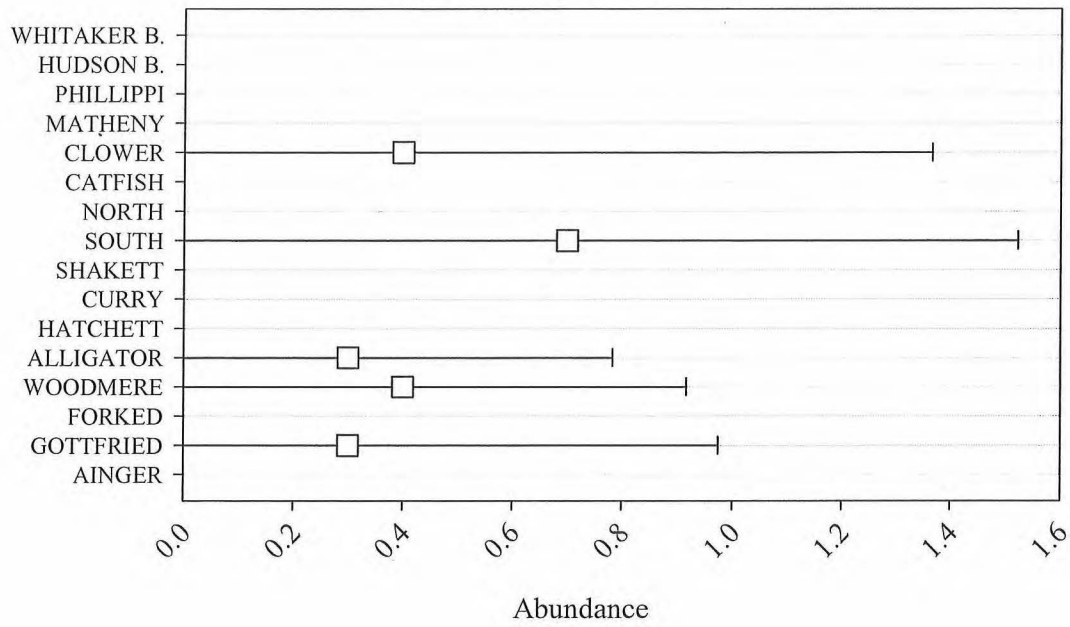
Maximum Oyster Height (cm)



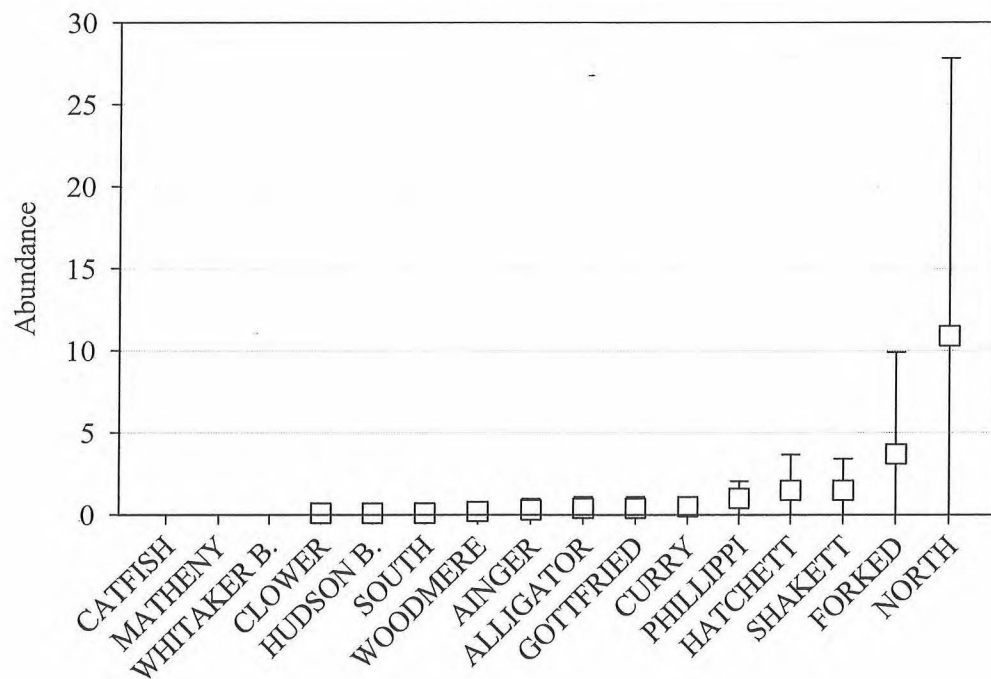
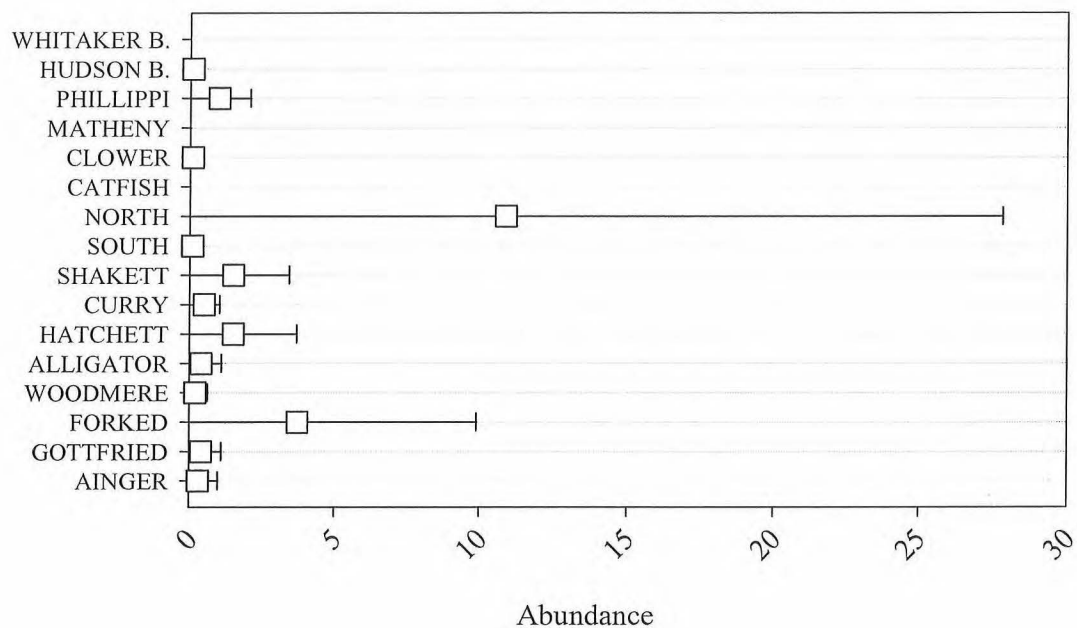
Subtidal Filamentous Algae Cover (%)



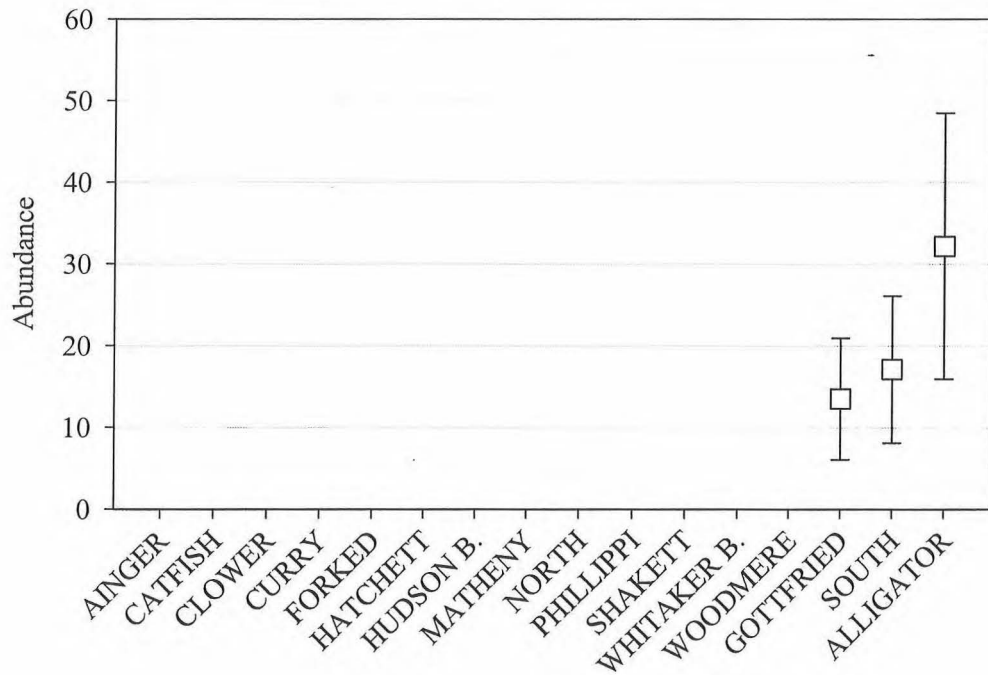
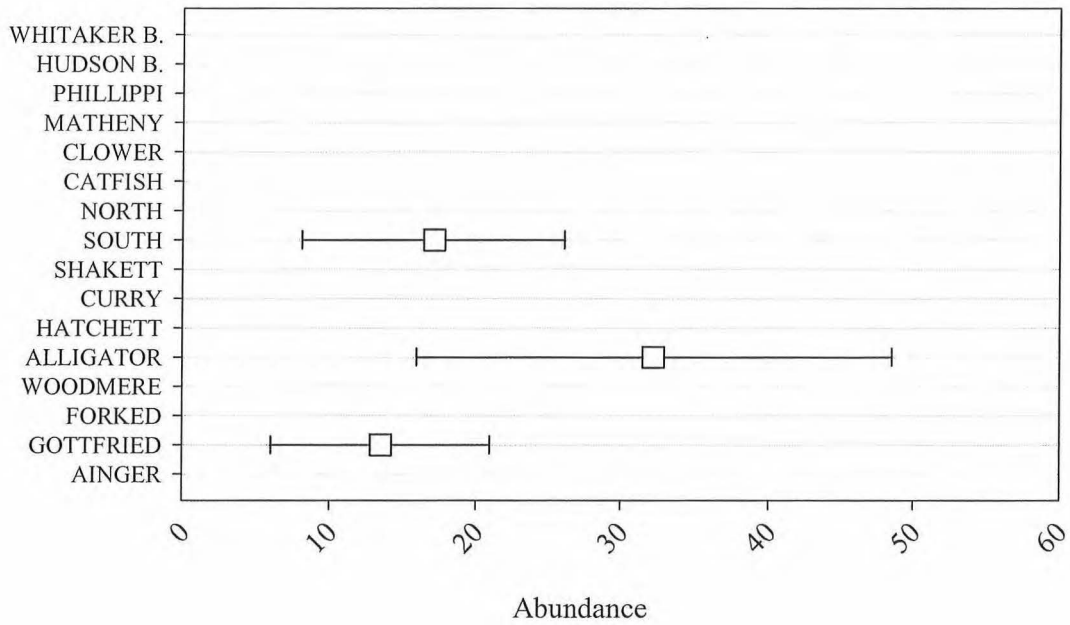
Intertidal Bare - Net Catch Total



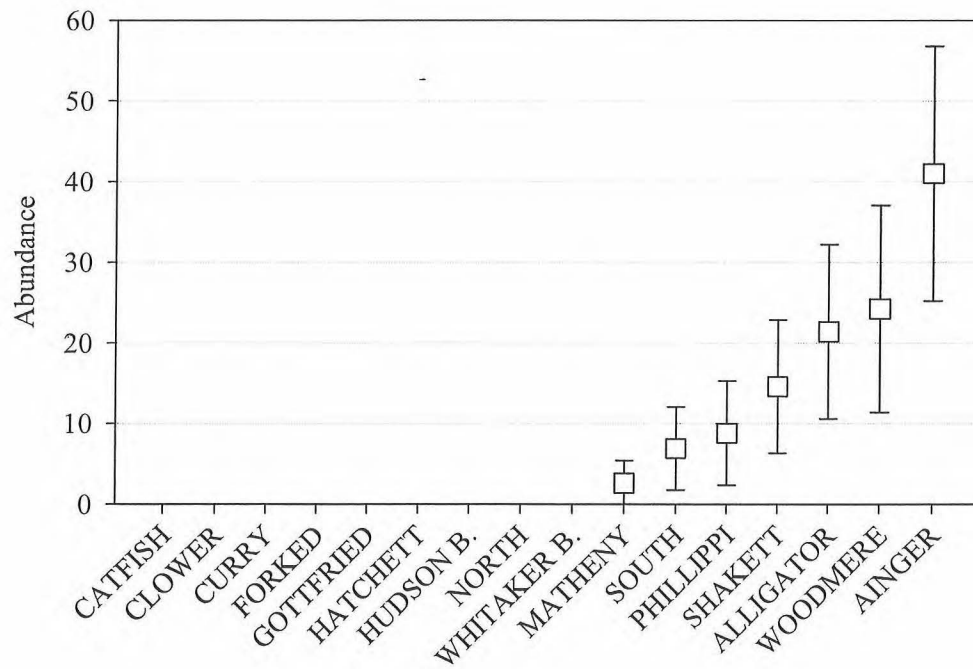
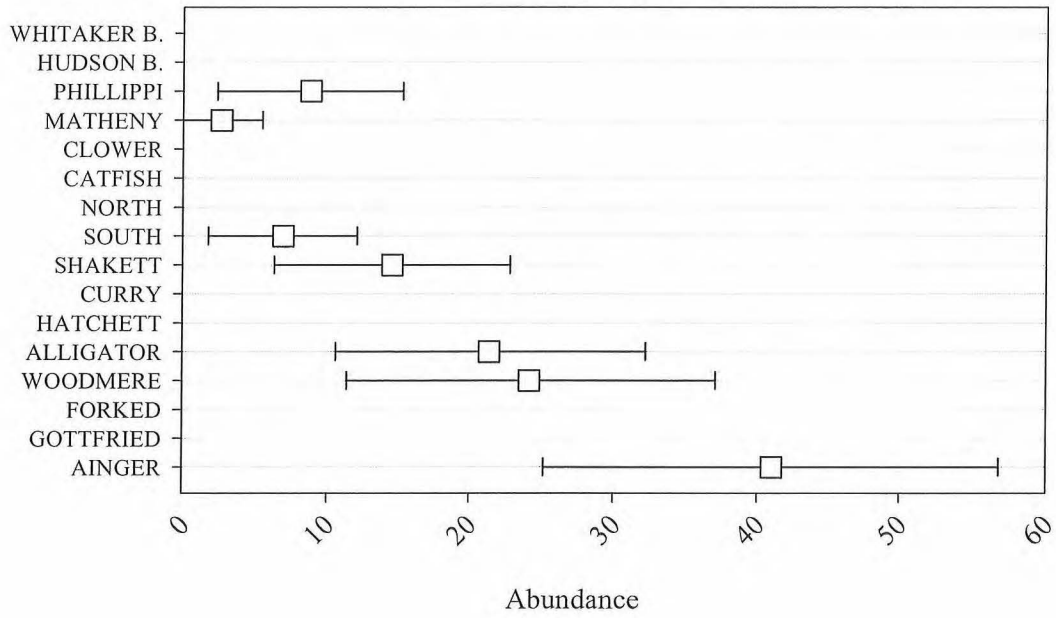
Subtidal Bare - Net Catch Total



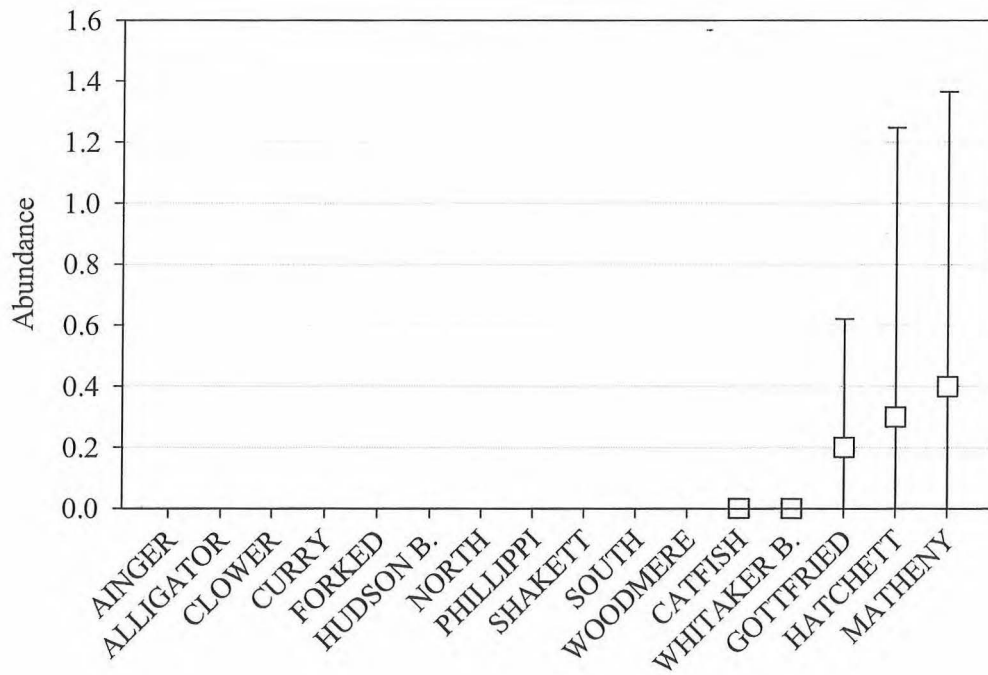
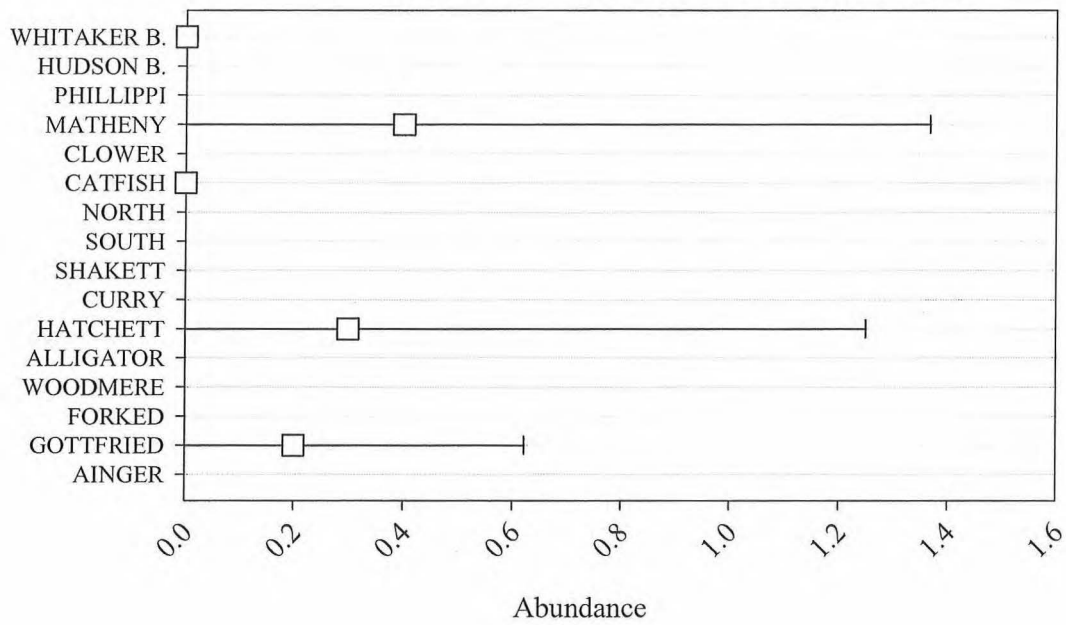
Intertidal Drift Algae - Net Catch Total

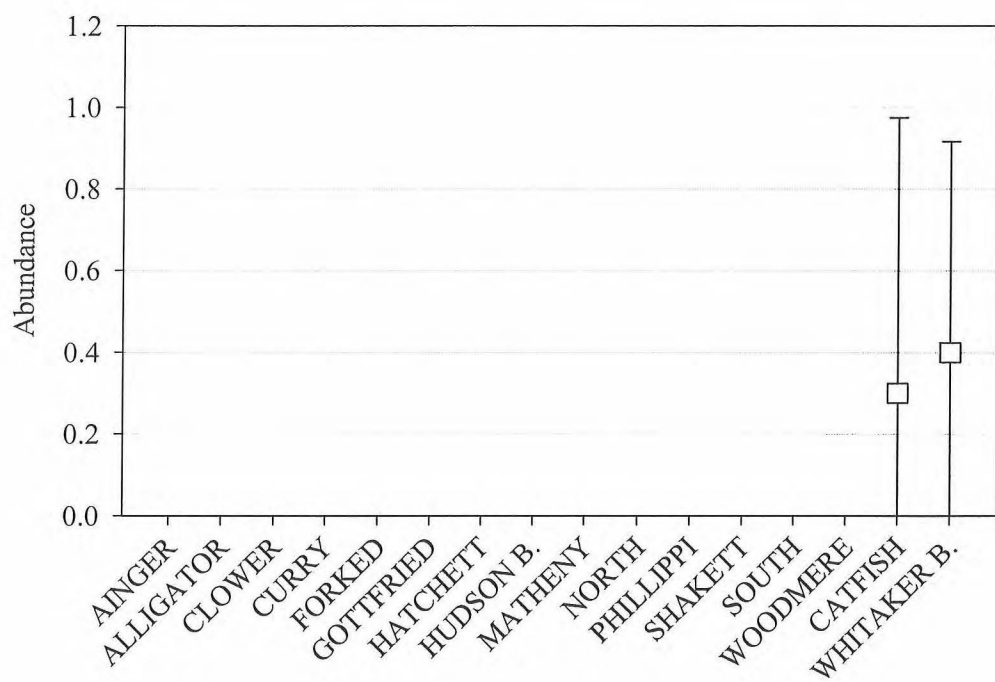
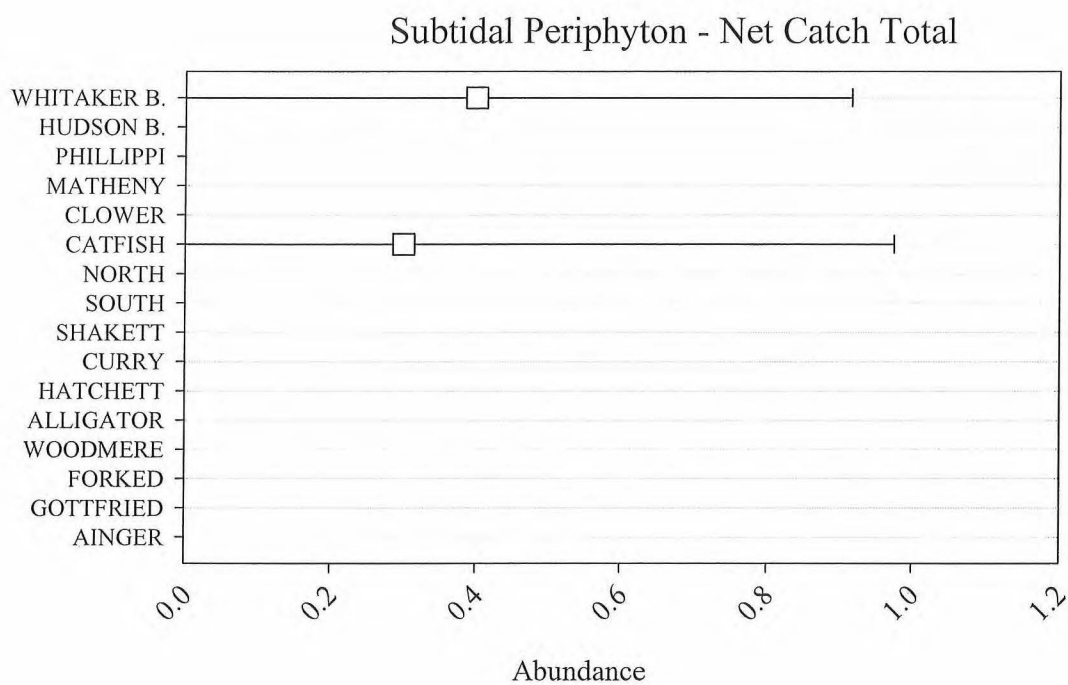


Subtidal Drift Algae - Net Catch Total



Intertidal Periphyton - Net Catch Total





Subtidal SAV - Net Catch Total

