

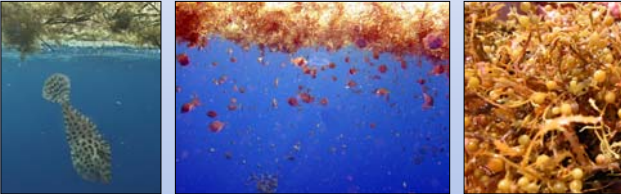
# Comparisons of Open Ocean, Surface Fish Communities off North Carolina in Two Habitats: Sargassum versus Open Water

Tara L. Casazza and Steve W. Ross

Center for Marine Science, University of North Carolina Wilmington

## INTRODUCTION

In the western North Atlantic pelagic *Sargassum* forms a dynamic floating habitat that supports a diverse assemblage of marine organisms, including fishes, invertebrates, sea turtles, marine birds and marine mammals. *Sargassum* habitat serves as a primary nursery area for many juvenile fishes, some of which are commercially important species (dolphinfish, jacks, amberjacks). Several studies have documented fishes associated with pelagic *Sargassum*, yet most of these studies were descriptive surveys and lacked data on ecological aspects of the community. Additionally, no studies have compared *Sargassum* and adjacent open water communities. Although diets have been documented for a few *Sargassum*-associated fish species, data are lacking for the majority of fish species in this community. The objectives of this study are to acquire a more complete picture of the community structure, feeding habits and behaviors of fishes collected in *Sargassum* and open water habitats using multiple sampling methods.



## METHODS

- Surface waters in or near the Gulf Stream off NC were sampled for fishes during summers of 1999-2003; 2 underwater video stations in 1999
- Specimens collected by small mesh neuston net (1 x 3 m), dip net, hook & line, long line
- Fishes sorted from algae and preserved at sea, algae weighed and discarded
- Fishes identified, measured, weighed and preserved
- Mean # of individuals and spp. compared in open water and *Sargassum* habitats
- Stomachs removed from dominant spp., commercially important spp. and endemic spp.
- Stomach contents identified to lowest practical taxa, enumerated, measured volumetrically
- Diet composition analyzed for %N, %V, %F
- Stomach contents supplemented with stable  $\delta^{13}C$  &  $\delta^{15}N$  isotope data for selected spp.



Figure 1. Collection sites for fishes in *Sargassum* and open water habitats off NC during summers of 1999-2003.

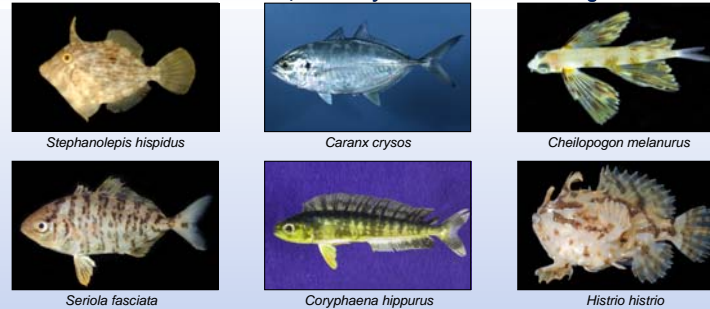
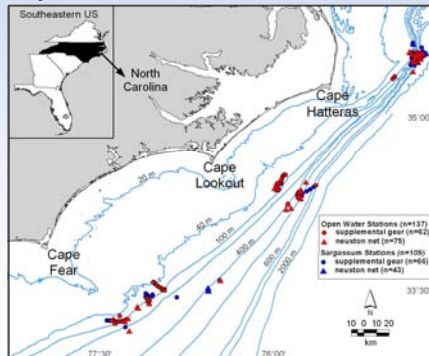
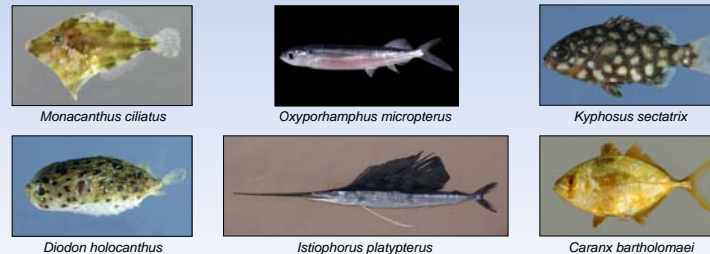


Table 1. Numbers of individuals collected in *Sargassum* and open water habitats off North Carolina during summers of 1999-2003.

Species	S	OW	Species	S	OW
<i>Ablenes hians</i>	15	14	<i>Hyporhamphus unifasciatus</i>	0	1
<i>Abudefduf saxatilis</i>	51	0	<i>Istiophorus platypterus</i>	4	44
<i>Albia egmontis</i>	4	1	<i>Katsuwonus pelamis</i>	0	2
<i>Aletris ciliaris</i>	0	4	<i>Kyphosus incisor</i>	6	1
<i>Aluterus heudelotii</i>	71	6	<i>Kyphosus sectatrix</i>	30	2
<i>Aluterus monoceros</i>	38	4	<i>Lagodon rhomboides</i>	1	0
<i>Aluterus schoepfii</i>	16	15	<i>Labotes surinamensis</i>	13	1
<i>Aluterus scriptus</i>	32	16	<i>Makaira nigricans</i>	0	1
<i>Argyropogon aculeatus</i>	1	0	<i>Monacanthus ciliatus</i>	144	46
<i>Ausis tzaard</i>	2	0	<i>Monacanthus tocheri</i>	11	7
<i>Balistes capricornis</i>	353	67	<i>Mugil curema</i>	1	8
<i>Byx duncckeri</i>	8	1	<i>Multidactylus martinicus</i>	1	0
<i>Cantherhines macrocerus</i>	5	2	<i>Myxophium affine</i>	2	25
<i>Cantherhines pultus</i>	13	4	<i>Myxophium obtusirostre</i>	0	10
<i>Canthidermis maculata</i>	19	0	<i>Myxophium punctulatum</i>	1	4
<i>Canthidermis sufflamen</i>	21	7	<i>Myxophium setosum</i>	0	1
<i>Caranx bartholomaei</i>	4	0	<i>Oxyphorhamphus micropterus</i>	75	53
<i>Caranx crysos</i>	1655	521	<i>Parexocoetus brachypterus</i>	203	201
<i>Caranx lugubris</i>	3	0	<i>Platybelleone argalis</i>	3	2
<i>Caranx ruber</i>	51	8	<i>Prognichthys occidentalis</i>	69	81
<i>Carcharhinus falciformis</i>	1	0	<i>Psenes cyanophrys</i>	5	0
<i>Cheilopogon cyanopterus</i>	5	12	<i>Pseudupeneus maculatus</i>	3	1
<i>Cheilopogon exilis</i>	3	7	<i>Remora osteococh</i>	1	0
<i>Cheilopogon furcatus</i>	4	8	<i>Scomber japonicus</i>	0	27
<i>Cheilopogon melanurus</i>	475	291	<i>Scomber scombrus</i>	0	6
<i>Chilomycterus</i> sp.	0	1	<i>Solea crumenophthalmus</i>	4	5
<i>Cipeus harengus</i>	0	216	<i>Selene setapinnis</i>	1	1
<i>Coryphaena equiseilis</i>	18	9	<i>Selene vomer</i>	0	3
<i>Coryphaena hippurus</i>	147	53	<i>Seriola dumetilli</i>	1	0
<i>Cyclothone</i> sp.	1	0	<i>Seriola fasciata</i>	60	6
<i>Cypselurus comatus</i>	0	2	<i>Seriola rivoliana</i>	38	4
<i>Diapturus punctatus</i>	164	153	<i>Seriola</i> sp.	265	26
<i>Diaphus dameritii</i>	1	0	<i>Seriola zonata</i>	4	1
<i>Diodon holocanthus</i>	8	2	<i>Sphyraena barracuda</i>	0	1
<i>Diodon hystrix</i>	1	4	<i>Sphyraena borealis</i>	1	0
<i>Echeneis nasutus</i>	2	1	<i>Stephanolepis hispidus</i>	13499	1450
<i>Elaeatis bipinnulata</i>	22	2	<i>Stephanolepis setifer</i>	1	0
<i>Euleptorhamphus velox</i>	12	17	<i>Syngnathus bellus</i>	0	1
<i>Exocoetus obliquirostris</i>	1	3	<i>Syngnathus louisianae</i>	1	0
<i>Fistularia tabacaria</i>	1	1	<i>Syngnathus pelagicus</i>	16	1
<i>Gempylus serpens</i>	0	3	<i>Syndus syndus</i>	0	1
<i>Hemiramphus balao</i>	27	5	<i>Trachinotus carolinus</i>	0	2
<i>Hemiramphus brasiliensis</i>	19	19	<i>Trachinotus falcatus</i>	0	1
<i>Hippocampus erectus</i>	7	7	<i>Tylosurus acus</i>	30	6
<i>Hippocampus reidii</i>	1	1	<i>Tylosurus crocodilus</i>	1	0
<i>Hirundichthys affinis</i>	30	23	<i>Vinciguerria poweriae</i>	0	1
<i>Histro histrio</i>	23	0	<i>Xanthichthys ringens</i>	0	2
<i>Holocentrus</i> sp.	0	1	Total n	17905	3603



## COMMUNITY STRUCTURE DATA

- 17,905 fishes (73 spp.) collected from 109 *Sargassum* stations, 13,276 fishes (55 spp.) from 43 neuston tows
- 3603 fishes (76 spp.) collected from 137 open water stations, 2240 fishes (54 spp.) from 75 neuston tows
- For neuston net collections, #s of individuals & #s of spp. significantly higher in *Sargassum* habitat
- Positive relationship between quantity of *Sargassum* and #s of individuals

Table 2. Catch data for fishes collected off NC during summers of 1999-2003, \*\*=significant.

All Catch Data	S	OW
# of samples	109	137
# of species	73	76
# of individuals	17905	3603
NN Catch Data (2000-2003)	43	75
# of samples	55	54
# of individuals	13276	2240
mean # of spp.	10*	4
mean # of indiv.	309*	30

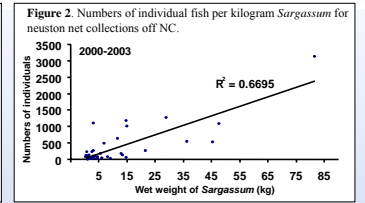


Figure 3. Pie charts of the percent volumes of food items found in the stomachs of dominant fish species collected in *Sargassum* and open water habitats off NC. Additional data are being analyzed.

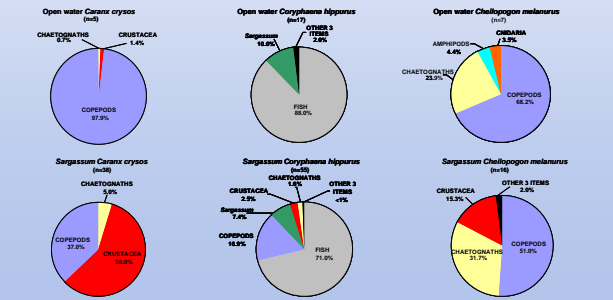
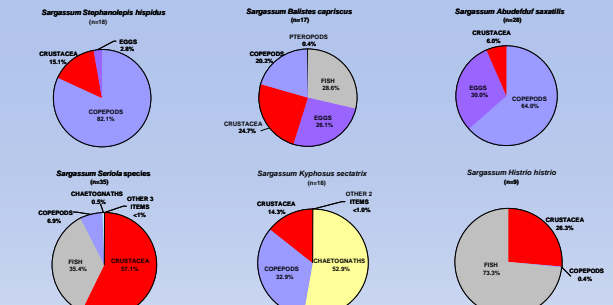


Figure 4. Pie charts of the percent volumes of food items found in the stomachs of fish species collected in *Sargassum* habitat off NC.



## DIET DATA

- 484 stomachs analyzed to date representing 23 fish species
- 88% of all stomachs analyzed contained food items, 53 total food items identified
- Overall: 13 spp. of copepods, 3 spp. of shrimp, 10 spp. of fish were identified
- Parasites (digenean trematodes & nematodes) observed in 44% of all stomachs

## FOOD ITEMS



## ACKNOWLEDGEMENTS

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