

U. S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center

Cruise Report

Date Submitted:

Platform:

Cruise Number:

Project Title:

Cruise Dates: -

Submitted by:
Field Party Chief

Date:

Approved by:
Lab Director

Date:

Approved by:
Director, SEFSC

Date:

INTRODUCTION

The NOAA Ship *Pisces* departed from Morehead City, NC, on 28 June 2019 for a Southeast Fishery-Independent Survey (SEFIS) research cruise in continental shelf and shelf-break waters off North and South Carolina. SEFIS was created by the National Marine Fisheries Service in 2010 and operates out of the NOAA-Beaufort Laboratory. This survey was created to conduct applied fishery-independent sampling and related research focusing on the assessment of spatial variability in distribution and abundance of red snapper and other reef species within the snapper-grouper complex, via data collected from fish traps, video cameras, and acoustics. Leg 1 occurred June 28 – July 12, 2019, and leg 2 occurred July 15 – 29, 2019. During this survey, chevron trap catches and associated underwater video recordings were collected from hardbottom habitats from Cape Hatteras, North Carolina to Georgetown, SC. A total of 569 stations were sampled with camera-trap arrays over 30 sea days, at depths ranging from 18 to 113 m.

OBJECTIVES

1. Fishery-independent sampling of randomly selected stations in North and South Carolina. Baited chevron traps, with two mounted high-definition video cameras were utilized for (a) hardbottom reef fish community assessments, (b) collection of reef fish for biological samples (i.e., otoliths and gonads), and (c) comparative gear sampling (cameras versus traps).
2. Use video cameras on chevron traps to address trap selectivity issues, locate and describe hardbottom habitats, and provide an additional index of abundance for stock assessments.
3. Use a conductivity, temperature, depth (CTD) instrument package to collect environmental data (temperature, salinity, dissolved oxygen, turbidity) at camera-trap sampling locations.

METHODS

Camera-Trap Sampling

Camera-trap gear consisted of two high definition video cameras mounted to a chevron fish trap. Additionally, one of the six traps in a group included an attached stereo-video camera for future fish length measurements. Chevron traps were composed of plastic-coated wire mesh. GoPro cameras (model HD Hero[®] H4) were attached above the mouth and nose of the trap (Figure 1). Traps were baited with Atlantic menhaden, *Brevoortia tyrannus*, and video cameras were set to record before deployment. Camera-traps were deployed at least 200 m apart on suspected or known hardbottom habitats, and soak time was targeted for approximately 90 min. Camera-traps were most often deployed in sets of six. A CTD cast (see environmental data collection) was conducted while traps were soaking. Fish catches were processed after trap retrieval. All fish were enumerated, weighed, and measured to the nearest millimeter. Individuals of many species (mostly species found in the snapper-grouper complex) were further processed for additional lengths and biological samples (otoliths, gonads, and DNA). Video files were downloaded and backed up on digital media storage devices. Biological samples and video files were brought to the Beaufort Laboratory for further processing and analysis.

Environmental Data Collection

Environmental data were collected with a Seabird CTD instrument package (model SBE 9) and Scientific Computer System (SCS) software. CTD casts were conducted near the middle of the camera-trap soak period; instruments were lowered to within 2 m of the bottom. Numerous water profile measurements were taken, including temperature (°C), salinity, dissolved oxygen (mg/L), average sound velocity (m/s), fluorescence (mg/m³), and beam transmission (%). CTD data were archived for further processing at the Beaufort Laboratory. SCS 4.0 was used to collect specific information for each fishing and CTD event, including soak

time/cast duration as well as start and end latitude, longitude, and depth (m).

SURVEY RESULTS

Camera-Trap Sampling

569 stations were sampled with camera-trap gear (Table 1). From these traps, fish were collected and worked up for length frequency data. Various reef fish species were further processed for otolith, gonad, and DNA tissues.

Environmental Data Collection

97 CTD casts (Table 1) were conducted during the cruise. CTD data will be processed with Seabird SBE Data Processing software (version 7.2), and archived in a database at the NMFS-Beaufort Laboratory for future analysis.

Hook-and-line Sampling

Hook-and-line sampling occurred during 15 evenings in an attempt to catch additional fish for diet, reproductive, and age sampling.

Time Lost

No substantial chunks of time were lost due to ship repairs or weather.

Acknowledgments

We thank the NOAA Ship Pisces officers and ship's company for their hard work during our cruise. The cruise came off with no major mechanical problems or loss of days-at-sea, a pleasant outcome not always realized in practice.

Table 1. Summary of station coordinates (DD), depth (m), date, and time (UTC) for each fishing event (camera-trap, Gear=324; hook and line, Gear=014) and CTD cast (Gear=298) conducted on the PC-19-03 survey.

Collection	Gear	Date	Time (UTC)	Latitude	Longitude	Depth (m)
193381	324	6/28/2019	20:16	34.35882	-76.3772	23
193382	324	6/28/2019	20:21	34.35175	-76.3785	23
193383	324	6/28/2019	20:25	34.34749	-76.3808	24
193384	324	6/28/2019	20:30	34.34148	-76.3798	25
193385	324	6/28/2019	20:33	34.33791	-76.3799	23
193386	324	6/28/2019	20:37	34.33336	-76.3791	27
193387	298	6/28/2019	20:49	34.32933	-76.3734	28
193388	324	6/29/2019	11:06	34.62075	-76.1362	39
193389	324	6/29/2019	11:08	34.62295	-76.1382	39
193390	324	6/29/2019	11:14	34.62401	-76.143	38
193391	324	6/29/2019	11:16	34.62415	-76.1466	38
193392	324	6/29/2019	11:18	34.62492	-76.1491	38
193393	324	6/29/2019	11:24	34.62122	-76.1478	39

193394	298	6/29/2019	11:34	34.61676	-76.1428	39
193395	324	6/29/2019	14:15	34.60563	-76.1364	39
193396	324	6/29/2019	14:17	34.60316	-76.1364	39
193397	324	6/29/2019	14:26	34.60603	-76.1471	39
193398	324	6/29/2019	14:33	34.60389	-76.147	38
193399	324	6/29/2019	14:40	34.60253	-76.1487	38
193400	324	6/29/2019	14:49	34.59921	-76.1457	39
193401	298	6/29/2019	15:01	34.59555	-76.1415	38
193402	324	6/29/2019	16:47	34.6162	-76.1586	38
193403	324	6/29/2019	16:51	34.61474	-76.1648	38
193404	324	6/29/2019	16:53	34.61486	-76.1683	38
193405	324	6/29/2019	16:59	34.61101	-76.1685	38
193406	324	6/29/2019	17:05	34.60397	-76.1716	38
193407	324	6/29/2019	17:10	34.60309	-76.1785	38
193408	298	6/29/2019	17:18	34.60387	-76.1846	38
193409	324	6/29/2019	20:11	34.60975	-76.1944	38
193410	324	6/29/2019	20:16	34.60744	-76.1994	37
193411	324	6/29/2019	20:18	34.60446	-76.1998	38
193412	324	6/29/2019	20:20	34.6023	-76.2001	37
193413	324	6/29/2019	20:24	34.59936	-76.1961	37
193414	324	6/29/2019	20:35	34.59213	-76.2041	37
193415	298	6/29/2019	20:43	34.59058	-76.2084	37
193416	324	6/30/2019	11:01	34.5431	-76.401	20
193417	324	6/30/2019	11:04	34.54058	-76.4018	20
193418	324	6/30/2019	11:06	34.53846	-76.4014	21
193419	324	6/30/2019	11:10	34.53723	-76.4037	20
193420	324	6/30/2019	11:16	34.53442	-76.4028	20
193421	324	6/30/2019	11:20	34.52923	-76.4049	19
193422	298	6/30/2019	11:31	34.52715	-76.4085	18
193423	324	6/30/2019	14:20	34.59427	-76.3111	27
193424	324	6/30/2019	14:22	34.59478	-76.3143	27
193425	324	6/30/2019	14:29	34.59624	-76.3229	27
193426	324	6/30/2019	14:35	34.58762	-76.3172	27
193427	324	6/30/2019	14:38	34.5845	-76.3156	27
193428	324	6/30/2019	14:40	34.58206	-76.3142	27
193429	298	6/30/2019	14:52	34.58376	-76.3074	29
193430	324	6/30/2019	17:11	34.56903	-76.331	26
193431	324	6/30/2019	17:13	34.56709	-76.3333	26
193432	324	6/30/2019	17:15	34.56548	-76.336	28
193433	324	6/30/2019	17:21	34.55693	-76.3383	24
193434	324	6/30/2019	17:24	34.5536	-76.3396	25
193435	324	6/30/2019	17:26	34.55138	-76.3395	26
193436	298	6/30/2019	17:38	34.54796	-76.3381	25

193437	324	6/30/2019	20:10	34.53005	-76.3465	24
193438	324	6/30/2019	20:17	34.52686	-76.3537	24
193439	324	6/30/2019	20:19	34.52375	-76.3527	24
193440	324	6/30/2019	20:23	34.51986	-76.3542	24
193441	324	6/30/2019	20:27	34.51581	-76.3546	24
193442	324	6/30/2019	20:31	34.51068	-76.3558	23
193443	298	6/30/2019	20:41	34.50678	-76.356	23
194800	014	6/30/2019	23:28	34.61633	-76.159	38
193444	324	7/1/2019	11:00	34.5437	-76.2052	40
193445	324	7/1/2019	11:05	34.5429	-76.2087	40
193446	324	7/1/2019	11:08	34.53909	-76.2101	39
193447	324	7/1/2019	11:12	34.53483	-76.2107	39
193448	324	7/1/2019	11:19	34.52449	-76.2091	40
193449	324	7/1/2019	11:25	34.52345	-76.2143	40
193450	298	7/1/2019	11:34	34.52269	-76.2191	40
193451	324	7/1/2019	14:10	34.5188	-76.2576	37
193452	324	7/1/2019	14:16	34.52689	-76.255	36
193453	324	7/1/2019	14:24	34.53975	-76.2514	36
193454	324	7/1/2019	14:28	34.54326	-76.2486	36
193455	324	7/1/2019	14:31	34.54537	-76.2443	36
193456	324	7/1/2019	14:36	34.54699	-76.2372	37
193457	298	7/1/2019	14:45	34.54948	-76.2336	38
193458	324	7/1/2019	16:50	34.55167	-76.2319	37
193459	324	7/1/2019	16:53	34.55217	-76.2283	37
193460	324	7/1/2019	16:56	34.55244	-76.2238	38
193461	324	7/1/2019	17:02	34.55755	-76.2162	38
193462	324	7/1/2019	17:06	34.56164	-76.2131	38
193463	324	7/1/2019	17:12	34.55825	-76.2058	38
193464	298	7/1/2019	17:22	34.5578	-76.2037	37
193465	324	7/1/2019	20:10	34.55413	-76.234	37
193466	324	7/1/2019	20:14	34.55819	-76.2334	37
193467	324	7/1/2019	20:22	34.56205	-76.2232	38
193468	324	7/1/2019	20:26	34.56684	-76.2226	37
193469	324	7/1/2019	20:29	34.57019	-76.2243	37
193470	324	7/1/2019	20:34	34.57383	-76.2247	36
193471	298	7/1/2019	20:42	34.57702	-76.2214	36
193472	324	7/2/2019	11:01	34.23916	-76.395	34
193473	324	7/2/2019	11:06	34.23377	-76.3971	32
193474	324	7/2/2019	11:09	34.2324	-76.4009	32
193475	324	7/2/2019	11:11	34.23346	-76.403	32
193476	324	7/2/2019	11:19	34.23066	-76.4048	34
193477	324	7/2/2019	11:26	34.23553	-76.4071	31
193478	298	7/2/2019	11:34	34.24083	-76.4061	34

193479	324	7/2/2019	14:20	34.132	-76.5473	37
193480	324	7/2/2019	14:24	34.1275	-76.5494	37
193481	324	7/2/2019	14:29	34.12209	-76.5512	37
193482	324	7/2/2019	14:32	34.11918	-76.5541	37
193483	324	7/2/2019	14:38	34.12123	-76.5566	37
193484	324	7/2/2019	14:42	34.12576	-76.5589	36
193485	298	7/2/2019	14:50	34.12841	-76.5616	39
193486	324	7/2/2019	17:35	34.26019	-76.6099	28
193487	324	7/2/2019	17:37	34.25902	-76.6068	31
193488	324	7/2/2019	17:41	34.25624	-76.602	31
193489	324	7/2/2019	17:45	34.25265	-76.5977	29
193490	324	7/2/2019	17:54	34.24236	-76.5941	31
193491	324	7/2/2019	17:56	34.24077	-76.5918	31
193492	298	7/2/2019	18:07	34.2379	-76.5864	33
193493	324	7/2/2019	20:19	34.30071	-76.5835	27
193494	324	7/2/2019	20:20	34.29878	-76.5851	23
193495	324	7/2/2019	20:25	34.29506	-76.5838	29
193496	324	7/2/2019	20:32	34.28758	-76.5769	29
193497	324	7/2/2019	20:38	34.28253	-76.5835	30
193498	324	7/2/2019	20:41	34.27939	-76.5864	30
193499	298	7/2/2019	20:49	34.27475	-76.5902	33
194801	014	7/2/2019	23:03	34.61658	-76.1652	39
193500	324	7/3/2019	11:15	34.16701	-76.146	105
193501	324	7/3/2019	11:18	34.16459	-76.1482	105
193502	324	7/3/2019	11:24	34.16119	-76.1564	77
193503	324	7/3/2019	11:32	34.15414	-76.1516	113
193504	324	7/3/2019	11:40	34.15079	-76.1575	108
193505	324	7/3/2019	11:45	34.14959	-76.1643	104
193506	298	7/3/2019	11:58	34.152	-76.1691	78
193507	324	7/3/2019	14:35	34.1967	-76.1179	84
193508	324	7/3/2019	14:38	34.19376	-76.117	71
193509	324	7/3/2019	14:48	34.19263	-76.1248	96
193510	324	7/3/2019	14:53	34.18708	-76.1308	69
193511	324	7/3/2019	14:57	34.1822	-76.1364	63
193512	324	7/3/2019	15:01	34.17866	-76.1398	59
193513	298	7/3/2019	15:14	34.17447	-76.1473	61
193514	324	7/3/2019	17:34	34.16534	-76.1673	57
193515	324	7/3/2019	17:37	34.16324	-76.172	57
193516	324	7/3/2019	17:41	34.16106	-76.1762	57
193517	324	7/3/2019	17:44	34.15826	-76.1798	57
193518	324	7/3/2019	17:47	34.15577	-76.1829	56
193519	324	7/3/2019	17:50	34.15386	-76.188	53
193520	298	7/3/2019	17:59	34.15257	-76.1939	53

193521	324	7/3/2019	20:25	34.13209	-76.2154	57
193522	324	7/3/2019	20:30	34.1328	-76.2109	59
193523	324	7/3/2019	20:33	34.13597	-76.211	54
193524	324	7/3/2019	20:36	34.14077	-76.2095	55
193525	324	7/3/2019	20:40	34.14466	-76.2039	53
193526	324	7/3/2019	20:44	34.14825	-76.1992	53
193527	298	7/3/2019	20:55	34.14793	-76.1946	53
194802	014	7/3/2019	22:54	34.25714	-76.6029	33
193528	324	7/4/2019	11:00	34.48536	-75.8771	75
193529	324	7/4/2019	11:02	34.48386	-75.8803	74
193530	324	7/4/2019	11:05	34.48292	-75.8852	74
193531	324	7/4/2019	11:11	34.47998	-75.8932	73
193532	324	7/4/2019	11:14	34.47694	-75.8968	72
193533	324	7/4/2019	11:17	34.47367	-75.8986	73
193534	298	7/4/2019	11:30	34.47007	-75.9038	72
193535	324	7/4/2019	14:09	34.46784	-75.8867	84
193536	324	7/4/2019	14:12	34.47079	-75.8827	87
193537	324	7/4/2019	14:17	34.47588	-75.8788	84
193538	324	7/4/2019	14:21	34.47984	-75.8742	87
193539	324	7/4/2019	14:26	34.48586	-75.8693	87
193540	324	7/4/2019	14:29	34.48844	-75.8677	88
193541	298	7/4/2019	14:38	34.49157	-75.8649	86
193542	324	7/4/2019	17:32	34.42347	-75.9507	69
193543	324	7/4/2019	17:37	34.42197	-75.9439	74
193544	324	7/4/2019	17:43	34.42469	-75.9431	72
193545	324	7/4/2019	17:46	34.42777	-75.9454	69
193546	324	7/4/2019	17:53	34.43287	-75.9382	71
193547	324	7/4/2019	17:56	34.43506	-75.9348	73
193548	298	7/4/2019	18:08	34.43557	-75.929	78
193549	324	7/4/2019	20:15	34.44731	-75.926	72
193550	324	7/4/2019	20:19	34.4514	-75.9224	71
193551	324	7/4/2019	20:23	34.45509	-75.9191	71
193552	324	7/4/2019	20:27	34.4597	-75.917	70
193553	324	7/4/2019	20:30	34.46083	-75.9129	71
193554	324	7/4/2019	20:36	34.46553	-75.9102	71
193555	298	7/4/2019	20:47	34.46927	-75.9084	72
194803	014	7/4/2019	23:37	34.18156	-76.1376	65
193556	324	7/5/2019	11:00	33.96791	-76.7812	38
193557	324	7/5/2019	11:02	33.96811	-76.7779	38
193558	324	7/5/2019	11:07	33.96566	-76.7769	38
193559	324	7/5/2019	11:14	33.96168	-76.7694	40
193560	324	7/5/2019	11:21	33.95466	-76.7657	40
193561	324	7/5/2019	11:28	33.95116	-76.7597	41

193562	298	7/5/2019	11:39	33.94765	-76.758	41
193563	324	7/5/2019	14:10	33.89924	-76.8178	40
193564	324	7/5/2019	14:13	33.89681	-76.8215	40
193565	324	7/5/2019	14:21	33.89459	-76.8195	40
193566	324	7/5/2019	14:25	33.88987	-76.8206	40
193567	324	7/5/2019	14:34	33.88718	-76.8136	41
193568	324	7/5/2019	14:37	33.88411	-76.8167	41
193569	298	7/5/2019	14:45	33.88086	-76.8179	40
193570	324	7/5/2019	18:00	33.86351	-76.837	40
193571	324	7/5/2019	18:03	33.862	-76.8402	38
193572	324	7/5/2019	18:08	33.85618	-76.8413	41
193573	324	7/5/2019	18:16	33.86057	-76.8335	41
193574	324	7/5/2019	18:26	33.85514	-76.8363	41
193575	324	7/5/2019	18:32	33.85134	-76.8301	42
193576	298	7/5/2019	18:52	33.84874	-76.8254	42
194804	014	7/5/2019	23:07	34.4349	-75.9349	74
193577	324	7/6/2019	11:00	33.64752	-76.9179	44
193578	324	7/6/2019	11:06	33.64362	-76.928	43
193579	324	7/6/2019	11:10	33.64316	-76.9334	42
193580	324	7/6/2019	11:13	33.64172	-76.9368	41
193581	324	7/6/2019	11:18	33.63868	-76.9422	43
193582	324	7/6/2019	11:21	33.63815	-76.9455	41
193583	298	7/6/2019	11:29	33.63829	-76.9522	40
193584	324	7/6/2019	16:19	33.67952	-76.9417	43
193585	324	7/6/2019	16:24	33.67934	-76.948	42
193586	324	7/6/2019	16:26	33.6788	-76.9507	41
193587	324	7/6/2019	16:28	33.67743	-76.9538	41
193588	324	7/6/2019	16:39	33.6645	-76.9701	40
193589	324	7/6/2019	16:43	33.66219	-76.9747	41
193590	298	7/6/2019	16:50	33.65923	-76.978	42
193591	324	7/6/2019	20:12	33.70331	-77.0297	39
193592	324	7/6/2019	20:15	33.69942	-77.0313	39
193593	324	7/6/2019	20:23	33.69046	-77.0358	38
193594	324	7/6/2019	20:27	33.68533	-77.0386	38
193595	324	7/6/2019	20:32	33.68036	-77.0417	38
193596	324	7/6/2019	20:34	33.67744	-77.0423	38
193597	298	7/6/2019	20:45	33.67253	-77.043	39
194805	014	7/6/2019	21:19	33.86194	-76.8403	40
193598	324	7/7/2019	11:00	34.34192	-77.2023	23
193599	324	7/7/2019	11:03	34.33931	-77.199	21
193600	324	7/7/2019	11:06	34.33685	-77.1963	22
193601	324	7/7/2019	11:09	34.33262	-77.1949	23
193602	324	7/7/2019	11:16	34.32851	-77.1878	22

193603	324	7/7/2019	11:23	34.32226	-77.1817	23
193604	298	7/7/2019	11:34	34.31791	-77.1813	23
193605	324	7/7/2019	14:25	34.27517	-77.3227	24
193606	324	7/7/2019	14:31	34.26957	-77.3232	22
193607	324	7/7/2019	14:41	34.26442	-77.33	23
193608	324	7/7/2019	14:45	34.25961	-77.3291	23
193609	324	7/7/2019	14:48	34.2558	-77.3294	23
193610	324	7/7/2019	14:51	34.25174	-77.3293	24
193612	324	7/7/2019	17:13	34.18987	-77.3155	27
193613	324	7/7/2019	17:16	34.18713	-77.3123	26
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193623	324	7/7/2019	20:23	34.16853	-77.2962	26
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193823	324	7/20/2019	11:23	33.47824	-76.9819	70
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193870	324	7/21/2019	20:26	33.6264	-76.8468	68
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193872	324	7/21/2019	20:40	33.6146	-76.8622	71
193873	324	7/21/2019	20:46	33.60912	-76.8668	89
193874	298	7/21/2019	20:52	33.60647	-76.871	81
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193877	324	7/22/2019	11:04	33.87128	-76.4807	77
193878	324	7/22/2019	11:06	33.86983	-76.4836	74
193879	324	7/22/2019	11:09	33.86732	-76.4871	74
193880	324	7/22/2019	11:12	33.86604	-76.4902	72
193881	298	7/22/2019	11:20	33.86423	-76.4952	71
193882	324	7/22/2019	14:15	33.81327	-76.5598	81
193883	324	7/22/2019	14:20	33.80884	-76.5655	88
193884	324	7/22/2019	14:24	33.80605	-76.5706	84
193885	324	7/22/2019	14:29	33.80207	-76.576	82
193886	324	7/22/2019	14:33	33.79799	-76.579	92
193887	324	7/22/2019	14:36	33.79493	-76.5831	94
193888	298	7/22/2019	14:45	33.79367	-76.5898	75
193889	324	7/22/2019	17:15	33.76442	-76.6205	110
193890	324	7/22/2019	17:20	33.76163	-76.6269	108
193891	324	7/22/2019	17:22	33.76162	-76.6303	92
193892	324	7/22/2019	17:29	33.75758	-76.6318	105
193893	324	7/22/2019	17:37	33.75581	-76.6369	101
193894	324	7/22/2019	17:44	33.75071	-76.643	106
193895	298	7/22/2019	17:54	33.74585	-76.6449	103

193896	324	7/22/2019	20:37	33.74657	-76.6496	94
193897	324	7/22/2019	20:48	33.74317	-76.6535	102
193898	324	7/22/2019	20:51	33.74063	-76.6573	103
193899	324	7/22/2019	20:55	33.7381	-76.6609	102
193900	324	7/22/2019	20:59	33.73456	-76.6651	104
193901	324	7/22/2019	21:02	33.73119	-76.669	106
193902	298	7/22/2019	21:11	33.72626	-76.6726	104
194814	014	7/22/2019	23:13	33.61522	-76.8624	69
193903	324	7/23/2019	11:00	33.05823	-78.6237	29
193904	324	7/23/2019	11:05	33.05531	-78.6301	28
193905	324	7/23/2019	11:12	33.05268	-78.6415	28
193906	324	7/23/2019	11:15	33.05071	-78.6453	28
193907	324	7/23/2019	11:19	33.04605	-78.6461	28
193908	324	7/23/2019	11:27	33.04287	-78.6566	28
193909	298	7/23/2019	11:35	33.04065	-78.6577	30
193910	324	7/23/2019	14:42	32.96001	-78.7443	30
193911	324	7/23/2019	14:50	32.95684	-78.7434	29
193912	324	7/23/2019	14:57	32.95568	-78.7527	30
193913	324	7/23/2019	15:00	32.95335	-78.754	28
193914	324	7/23/2019	15:02	32.95155	-78.7564	28
193915	324	7/23/2019	15:05	32.95011	-78.7585	30
193916	298	7/23/2019	15:12	32.94548	-78.758	32
193917	324	7/23/2019	18:36	32.83947	-78.9128	31
193918	324	7/23/2019	18:40	32.83916	-78.9188	31
193919	324	7/23/2019	18:43	32.8388	-78.9233	31
193920	324	7/23/2019	18:47	32.84228	-78.9227	31
193921	324	7/23/2019	18:55	32.83964	-78.9271	31
193922	324	7/23/2019	18:59	32.84157	-78.9298	31
193923	298	7/23/2019	19:10	32.83564	-78.9286	30
193924	324	7/24/2019	11:04	33.50514	-77.3463	33
193925	324	7/24/2019	11:11	33.50076	-77.3509	33
193926	324	7/24/2019	11:17	33.50206	-77.3544	33
193927	324	7/24/2019	11:26	33.49728	-77.3594	34
193928	324	7/24/2019	11:30	33.5001	-77.3607	34
193929	324	7/24/2019	11:33	33.50219	-77.3651	33
193930	298	7/24/2019	11:45	33.50015	-77.3694	32
193931	324	7/24/2019	14:15	33.47824	-77.4167	31
193932	324	7/24/2019	14:20	33.482	-77.4105	31
193933	324	7/24/2019	14:29	33.4805	-77.4072	31
193934	324	7/24/2019	14:33	33.48331	-77.4022	30
193935	324	7/24/2019	14:37	33.48724	-77.399	31
193936	324	7/24/2019	14:40	33.48921	-77.3947	31
193937	298	7/24/2019	14:47	33.49145	-77.3908	31

193938	324	7/24/2019	17:15	33.52655	-77.4123	31
193939	324	7/24/2019	17:21	33.53406	-77.4132	30
193940	324	7/24/2019	17:24	33.537	-77.4149	33
193941	324	7/24/2019	17:38	33.52221	-77.4238	30
193942	324	7/24/2019	17:45	33.53334	-77.423	29
193943	324	7/24/2019	17:48	33.53678	-77.4201	32
193944	298	7/24/2019	17:56	33.54202	-77.4191	35
193945	324	7/24/2019	21:33	33.61731	-77.6362	22
193946	324	7/24/2019	21:41	33.62899	-77.6369	24
193947	298	7/24/2019	21:50	33.63526	-77.6372	24
193948	324	7/25/2019	11:00	33.65875	-77.5083	28
193949	324	7/25/2019	11:03	33.66109	-77.5063	30
193950	324	7/25/2019	11:06	33.66431	-77.5069	25
193951	324	7/25/2019	11:10	33.66807	-77.506	30
193952	324	7/25/2019	11:20	33.68307	-77.4941	25
193953	324	7/25/2019	11:23	33.68653	-77.492	29
193954	298	7/25/2019	11:28	33.69034	-77.4923	29
193955	324	7/25/2019	14:15	33.71344	-77.6257	29
193956	324	7/25/2019	14:21	33.71844	-77.6254	26
193957	324	7/25/2019	14:30	33.71932	-77.6298	25
193958	324	7/25/2019	14:33	33.72287	-77.6299	27
193959	324	7/25/2019	14:36	33.72504	-77.6334	24
193960	324	7/25/2019	14:40	33.72797	-77.6379	26
193961	298	7/25/2019	14:45	33.73069	-77.6395	24
193962	324	7/25/2019	17:20	33.7976	-77.634	25
193963	324	7/25/2019	17:26	33.80703	-77.6371	24
193964	324	7/25/2019	17:31	33.81304	-77.6367	24
193965	324	7/25/2019	17:35	33.81654	-77.6395	27
193966	324	7/25/2019	17:42	33.81073	-77.6424	25
193967	324	7/25/2019	17:49	33.81319	-77.6465	25
193968	298	7/25/2019	17:55	33.81647	-77.6477	27
193969	324	7/25/2019	20:49	33.77346	-77.4913	33
193970	324	7/25/2019	21:00	33.77947	-77.4939	29
193971	324	7/25/2019	21:03	33.78331	-77.497	26
193972	298	7/25/2019	21:09	33.78585	-77.5035	31
193973	324	7/26/2019	10:59	34.42813	-76.9016	24
193974	324	7/26/2019	11:02	34.4313	-76.9032	21
193975	324	7/26/2019	11:08	34.4366	-76.8989	23
193976	324	7/26/2019	11:16	34.44172	-76.9042	24
193977	324	7/26/2019	11:20	34.44578	-76.9067	26
193978	324	7/26/2019	11:23	34.44952	-76.9068	22
193979	298	7/26/2019	11:31	34.45524	-76.9067	25
193980	324	7/26/2019	14:24	34.40562	-76.7038	26

193981	324	7/26/2019	14:26	34.40796	-76.7065	25
193982	324	7/26/2019	14:37	34.41259	-76.7049	27
193983	324	7/26/2019	14:44	34.4171	-76.7133	26
193984	324	7/26/2019	14:47	34.42054	-76.7121	27
193985	324	7/26/2019	14:50	34.42396	-76.7098	26
193986	298	7/26/2019	14:56	34.42743	-76.7083	25
193987	324	7/26/2019	17:35	34.41806	-76.6062	21
193988	324	7/26/2019	17:41	34.42519	-76.6076	23
193989	324	7/26/2019	17:53	34.44321	-76.6222	20
193990	324	7/26/2019	17:55	34.44542	-76.6243	20
193991	324	7/26/2019	17:58	34.44776	-76.624	22
193992	324	7/26/2019	18:05	34.45407	-76.6265	21
193993	298	7/26/2019	18:10	34.45779	-76.6292	24
193994	324	7/26/2019	20:43	34.38765	-76.5865	23
193995	324	7/26/2019	20:46	34.38703	-76.5829	20
193996	324	7/26/2019	20:49	34.38798	-76.5799	22
193997	324	7/26/2019	20:52	34.38826	-76.5757	22
193998	324	7/26/2019	20:57	34.38926	-76.5666	23
193999	324	7/26/2019	20:59	34.3891	-76.5626	21
194000	298	7/26/2019	21:07	34.38889	-76.5574	21
194001	324	7/27/2019	10:59	34.29219	-77.1532	25
194002	324	7/27/2019	11:02	34.29464	-77.1566	25
194003	324	7/27/2019	11:04	34.29637	-77.1596	24
194004	324	7/27/2019	11:07	34.29938	-77.1612	25
194005	324	7/27/2019	11:11	34.30065	-77.1638	25
194006	324	7/27/2019	11:17	34.30307	-77.1626	25
194007	298	7/27/2019	11:24	34.30696	-77.1593	24
194008	324	7/27/2019	14:15	34.30674	-77.0512	26
194009	324	7/27/2019	14:21	34.30276	-77.0555	26
194010	324	7/27/2019	14:33	34.30815	-77.0561	25
194011	324	7/27/2019	14:39	34.31021	-77.0602	26
194012	324	7/27/2019	14:44	34.31298	-77.0606	25
194013	324	7/27/2019	14:48	34.31541	-77.0625	25
194014	298	7/27/2019	14:54	34.31766	-77.0667	26
194015	324	7/27/2019	17:41	34.30729	-76.8891	27
194016	324	7/27/2019	17:43	34.30954	-76.8889	27
194017	324	7/27/2019	17:49	34.31336	-76.8956	28
194018	324	7/27/2019	17:54	34.31598	-76.8947	28
194019	324	7/27/2019	17:58	34.3199	-76.8937	27
194020	324	7/27/2019	18:01	34.32274	-76.8904	28
194021	298	7/27/2019	18:07	34.32548	-76.8869	27
194022	324	7/27/2019	20:25	34.30997	-76.8842	28
194023	324	7/27/2019	20:27	34.31245	-76.885	27

194024	324	7/27/2019	20:30	34.31647	-76.8872	27
194025	324	7/27/2019	20:32	34.31943	-76.8882	27
194026	324	7/27/2019	20:38	34.31779	-76.8838	27
194027	324	7/27/2019	20:43	34.31874	-76.8771	27
194028	298	7/27/2019	20:49	34.32062	-76.8728	28
194029	324	7/28/2019	11:00	34.70285	-75.8485	40
194030	324	7/28/2019	11:03	34.69989	-75.8438	40
194031	324	7/28/2019	11:07	34.69725	-75.8384	40
194032	324	7/28/2019	11:14	34.69936	-75.8315	40
194033	324	7/28/2019	11:17	34.7029	-75.8289	41
194034	324	7/28/2019	11:21	34.70651	-75.8243	40
194035	298	7/28/2019	11:32	34.70939	-75.8217	41
194036	324	7/28/2019	14:25	34.65149	-75.7517	58
194037	324	7/28/2019	14:28	34.65374	-75.7492	58
194038	324	7/28/2019	14:35	34.64911	-75.7416	59
194039	324	7/28/2019	14:54	34.667	-75.7296	59
194040	324	7/28/2019	15:00	34.66793	-75.738	57
194041	324	7/28/2019	15:02	34.66729	-75.7419	56
194042	298	7/28/2019	15:09	34.66887	-75.7462	56
194043	324	7/28/2019	18:00	34.60867	-75.7994	60
194044	324	7/28/2019	18:02	34.6107	-75.7973	59
194045	324	7/28/2019	18:05	34.61359	-75.7972	59
194046	298	7/28/2019	18:14	34.61861	-75.8003	57



Figure 1. Chevron trap with video cameras used to sample reef fish on the PC-19-03 survey.

CRUISE PARTICIPANTS

Name / Title / Organization

Leg 1

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Rob Cheshire / Scientist-Deck Watch / NMFS-Beaufort
Zach Gillum / Scientist-Deck Watch / SEFIS Riverside
David Hoke / Scientist-Deck Watch / NMFS-Manteo, NC
Anne Markwith / Scientist-Deck Watch / NCDMF
Christopher Pickens / Scientist-Deck Watch / SCDNR
Amelia Grace Roskar / Scientist-Deck Watch / UNC-CH
Christina Schobernd / Video Watch / NMFS-Beaufort
Brad Teer / Scientist-Deck Watch / SEFIS Riverside

Leg 2

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Lauren Bacharach / Scientist-Video Watch / SEFIS Riverside
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David Hoke / Scientist-Deck Watch / NMFS-Manteo, NC
Todd Kellison / Scientist-Deck Watch / NMFS-Beaufort
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Brad Teer / Scientist-Deck Watch / SEFIS Riverside

Cruise Report Prepared by: Nate Bacheler and Christina Schobernd

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