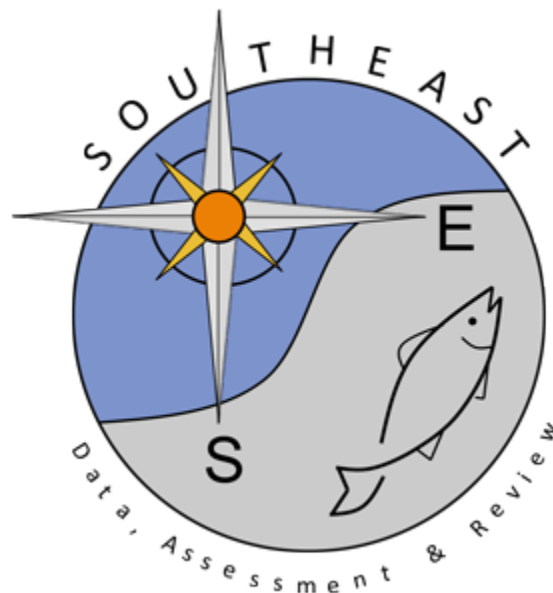


Length frequency distributions for Mutton Snapper collected by TIP in the Southeast from 1983 to 2022

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Introduction

This report documents changes in the length frequency distributions (LFDs) of mutton snapper samples collected from the Southeastern United States from 1983 to 2022. The 2015 mutton snapper update for SEDAR 15A produced length frequency distributions (LFDs) for fork length (FL) and max total length (maxTL). In this document, LFDs for both FL and TL using the mutton snapper (MTS) regions described below were created for assessment staff to use in ASAP and Stock Synthesis models.

Materials and Methods

Length samples from commercial fisheries were obtained from the Trip Interview Program (TIP) database housed at the NOAA Fisheries Southeast Fisheries Science Center. Data were provided in Microsoft Access with each TIP table present (interview, effort, landings, sample, observation, and observation sample) and imported and formatted with a SAS program (S79_TIP_import_mdb_raw.sas). The program brings in each table while defining variable names and types. The program looks for errors (odd length types, units, extreme values, etc) and corrects them. Errors were also reported to TIP to ensure that the same corrections are not needed for the next assessment. Assessment staff will also use length/length and length/weight regressions to create a FL, maxTL, and weight for each record when values are missing using data from the data workshop. Finally the SAS program sets up the LFDs and fits the data into the MTS regions (Figure 1). Data was moved into the regions first by area fished and then county landed if area fished was not available. After data was put in the MTS regions flags were added to identify records to remove and include/exclude for FL and TL LFDs. Fork lengths between 200 and 900 mm were kept and marked for FL LFD use. Total lengths between 200 and 1000 mm were kept and marked for TL LFD use. There were few max TL observations in the TIP data. If an MTS region could not be determined the records were flagged for removal and exclusion from LFDs. Records were flagged for removal and exclusion from LFDs where bias type was not indicated as “NO BIAS KNOWN” or “NO INFORMATION”. Additionally, records were flagged for removal and exclusion from LFDs if fishing mode was not indicated as “COMMERCIAL” or “UNKNOWN”. Where samples were identified as “Is not random”, records were flagged for removal and exclusion from LFDs.

Data were exported using the provided SEDAR data format requested by assessors with the addition of all flags and all calculated values from regressions removed. Descriptive statistics (PROC Means) of trimmed values for FL and TL were generated for each MTS region over all years and for each year/MTS region. LFDs were visually represented (PROC Chart) with trimmed values for FL and TL for each MTS region over all years and for each year/MTS region (all using 1 cm length bins).

Results

Assessment staff requested a non-weighted dataset with all fields retained, including the removal flags. Data flagged for exclusion of LFDs were just under 6% of all records (Table 1 & 2). The number of TL measurements for mutton snapper is very low (~6%) of all values to be included in any LFD. Most quantity values, the frequency multiplier in TIP data, were 1 (95.06%) and 1.72% of quantity values were over 3 (Table 3). Table 4 shows the means and standard deviations for each MTS region. The number of FL and TL records for each MTS region and year combination are shown in Tables 5 and 6 respectively. For fork lengths, only Southern Florida has a consistent number of samples for the entire time series, and the total lengths were not sufficient for analysis. Longlines gears comprised 53.02% of TIP samples with hook and line gears being the second most abundant at 33.81% (Table 7). Length distributions for each of the MTS regions across all years for FL and TL are shown in Figures 2 and 3 respectively. Mean and median weights were calculated for mutton snapper across all years for each MTS region in kilograms and pounds (Table 8)

Table 1. TIP fork length (FL) records and their status for exclusion in LFDs.

Include_FL_LF	N Obs	Mean	Std Dev	Minimum	Maximum	N	Percentage
N	6668	539.536	109.9387	284	1017.5	1306	4.92%
Y	25235	593.355	121.4853	204	885	25235	95.08%

Table 2. TIP total length (TL) records and their status for exclusion in LFDs.

Include_TL_LF	N Obs	Mean	Std Dev	Minimum	Maximum	N	Percentage
N	26240	576.371	104.3583	411	822	35	2.22%
Y	5663	588.303	148.1925	302.5	972.5	1543	97.78%

Table 3. Quantity (frequency) values for TIP FL data values.

QUANTITY	Mean	Std Dev	Minimum	Maximum	N	Percentage
1	586.235	121.3581	204	1017.5	24383	96.73%
2	634.215	116.9668	292.5	850	540	2.14%
3	644.670	106.0677	350	802.5	174	0.69%
4	685.000	88.5965	390	802.5	58	0.23%
5	655.625	112.7286	380	797.5	24	0.10%
6	609.773	117.8530	400	792.5	11	0.04%
7	652.143	67.9526	530	747.5	7	0.03%
8	535.000	115.2172	340	637.5	5	0.02%
9	587.500	56.5685	547.5	627.5	2	0.01%
10	722.500	77.7817	667.5	777.5	2	0.01%
11	552.500	.	552.5	552.5	1	0.00%

Table 4. TIP FL data values (mean, std dev, min, max, n, and percentage) by MTS region.

MTS Region	N Obs	Mean	Std Dev	Minimum	Maximum	N	Percentage
West of FL	44	678.477	100.1855	433	801	44	0.18%
NW FL	81	634.660	96.6131	401	822	81	0.34%
SW FL	3869	623.942	111.0349	335	885	3869	16.19%
Tortugas	11179	622.267	108.6014	234	879	11179	46.77%
Keys	1880	539.798	117.7880	242	861	1880	7.87%
SE FL	3334	457.244	91.1316	210	875	3334	13.95%
NE FL	2308	592.959	106.9245	241	846	2308	9.66%
North of FL	1206	627.974	92.1300	204	880	1206	5.05%

Table 5. Non-excluded sample frequencies for each year by MTS region for TIP FL data values (quantities not applied).

Year	West of FL	NW FL	SW FL	Tortugas	Keys	SE FL	NE FL	North of FL	Total
1986	0	0	5	7	14	0	0	0	26
1987	0	0	0	22	0	0	0	0	22
1988	0	0	0	0	0	8	0	0	8
1989	1	0	0	0	0	0	0	0	1
1990	0	0	13	255	21	0	0	1	290
1991	0	0	8	271	64	6	3	10	362
1992	0	0	9	514	131	77	15	3	749
1993	17	0	20	284	34	0	36	25	416
1994	0	0	48	360	32	5	30	1	476
1995	1	0	1	239	0	0	50	14	305
1996	0	0	0	161	0	0	3	3	167
1997	0	1	0	357	69	0	0	0	427
1998	0	0	176	1109	15	191	22	18	1531
1999	0	0	233	1897	12	292	191	57	2682
2000	0	0	158	1231	29	433	145	29	2025
2001	0	14	246	791	48	518	23	38	1678
2002	0	0	151	693	18	441	8	17	1328
2003	0	0	103	877	37	282	15	73	1387
2004	0	1	246	501	11	168	1	45	973
2005	1	0	324	213	54	165	12	53	822
2006	0	11	227	393	28	97	11	41	808
2007	0	1	103	284	17	88	61	27	581
2008	0	0	126	152	54	68	8	15	423
2009	0	0	98	57	147	67	11	21	401
2010	1	0	143	241	100	16	7	17	525
2011	2	0	96	144	84	43	29	33	431
2012	0	0	146	210	64	103	58	19	600
2013	0	0	129	240	92	41	36	8	546
2014	0	0	138	161	106	60	122	8	595
2015	0	0	119	87	93	22	257	10	588
2016	0	2	127	20	56	37	245	13	500
2017	1	11	150	117	72	26	159	34	570
2018	7	18	175	191	95	33	15	22	556
2019	4	5	115	42	68	86	100	55	475
2020	2	0	58	15	54	2	246	214	591
2021	6	12	58	15	95	16	180	134	516
2022	1	5	289	14	79	33	264	169	854
Total	44	81	4038	12165	1893	3424	2363	1227	25235

Table 6. Non-excluded sample frequencies for each year by MTS region for TIP TL data values (quantities not applied).

Year	West of FL	NW FL	SW FL	Tortugas	Keys	SE FL	NE FL	North of FL	Total
1983	0	0	0	0	0	0	0	1	1
1984	0	0	0	0	0	0	0	14	14
1985	0	0	0	0	0	0	0	25	25
1986	0	0	0	0	0	0	1	16	17
1987	0	0	0	0	0	0	0	53	53
1988	0	0	0	16	41	2	0	77	136
1989	0	0	0	35	274	0	0	30	339
1990	0	0	2	158	259	23	6	127	575
1991	1	0	26	46	177	3	0	69	322
1992	0	0	15	24	45	281	1	14	380
1993	0	0	43	38	103	160	0	30	374
1994	0	0	26	101	69	233	0	5	434
1995	0	0	88	83	263	100	0	8	542
1996	0	0	131	81	73	164	1	11	461
1997	0	0	232	176	28	242	24	9	711
1998	0	0	191	99	49	227	8	14	588
1999	0	0	0	10	0	0	0	21	31
2000	0	0	0	0	0	0	0	4	4
2001	0	0	0	0	0	0	0	1	1
2002	0	0	0	0	0	0	0	4	4
2003	0	0	0	0	0	0	0	6	6
2004	0	0	0	0	0	5	0	30	35
2005	0	0	0	0	14	0	0	19	33
2006	0	0	0	0	0	0	0	10	10
2007	0	0	0	0	0	0	0	9	9
2008	0	0	0	0	0	0	0	11	11
2009	0	0	0	0	102	5	0	2	109
2010	0	0	0	5	79	14	0	3	101
2011	0	0	0	4	70	6	0	6	86
2012	0	0	0	0	40	13	0	24	77
2013	0	0	0	43	25	3	0	11	82
2014	0	0	0	0	20	0	0	5	25
2015	0	0	0	0	0	0	0	5	5
2016	0	0	0	0	0	0	1	1	2
2017	0	0	0	0	0	0	0	2	2
2018	0	0	0	0	0	0	0	11	11
2019	0	0	0	0	0	0	0	16	16
2020	0	0	0	0	0	0	0	17	17
2021	0	0	0	0	0	0	0	14	14
Total	1	0	754	919	1731	1481	42	735	5663

Table 7. Gear distributions across all years for TIP FL data values.

Gear	Gear Group	N Obs	Mean	Std Dev	Minimum	Maximum	N	Percentage
BY HAND	DIVE	118	648.767	107.2666	260	817.5	118	0.50%
BY HAND, DIVING GEAR	DIVE	93	531.489	108.5154	355	792	93	0.39%
SPEARS	DIVE	388	536.742	95.5438	335	798	388	1.64%
SPEARS, DIVING	DIVE	6	678.667	64.8280	553	734	6	0.03%
BUOY GEAR, VERTICAL	H&L	34	548.471	93.9230	392	721	34	0.14%
LINES HAND	H&L	1731	537.730	110.9045	234	800	1731	7.33%
LINES POWER TROLL OTHER	H&L	97	466.629	82.1295	350	732	97	0.41%
REEL, ELECTRIC OR HYDRAULIC	H&L	3088	609.102	102.0681	204	880	3088	13.08%
REEL, MANUAL	H&L	66	594.439	111.4078	388	801	66	0.28%
ROD AND REEL	H&L	2909	475.797	106.1774	210	875	2909	12.32%
ROD AND REEL, ELECTRIC (HAND)	H&L	54	576.009	119.7887	351	811	54	0.23%
LINES LONG SET WITH HOOKS	LONGLINE	72	594.625	107.3951	430	804	72	0.31%
LINES LONG, REEF FISH	LONGLINE	12442	641.923	103.3160	335	885	12442	52.71%
CAST NETS	OTHER	2	427.000	7.0711	422	432	2	0.01%
GILL NETS, OTHER	OTHER	1	432.500	.	432.5	432.5	1	0.00%
TRAMMEL NETS	OTHER	26	396.923	61.1772	267.5	497.5	26	0.11%
POTS & TRAPS, LOBSTER OFFSHORE	TRAP	2	401.000	12.7279	392	410	2	0.01%
POTS AND TRAPS, FISH	TRAP	1791	575.815	114.8864	290	879	1791	7.59%
POTS AND TRAPS, SPINY LOBSTER	TRAP	565	502.123	106.0485	262.5	815	565	2.39%
NOT CODED	UNKLKNOWN	113	674.602	90.6133	450	790	113	0.48%
UNSPECIFIED GEAR	UNKLKNOWN	5	534.700	106.5960	362.5	628	5	0.02%

Table 8a. Mutton snapper mean and median weights in kilograms by MTS regions all years combined.

	WEST OF FL	NW FL	SW FL	TORTUGAS	KEYS	SE FL	NE FL	NORTH OF FL
Mean Weight	6.097	5.531	4.953	4.334	3.010	2.159	4.251	5.335
Median Weight	6.149	5.480	4.675	4.172	2.695	1.756	4.165	5.351

Table 8b. Mutton snapper mean and median weights in pounds by MTS regions all years combined.

	WEST OF FL	NW FL	SW FL	TORTUGAS	KEYS	SE FL	NE FL	NORTH OF FL
Mean Weight	13.441	12.193	10.919	9.555	6.635	4.759	9.371	11.761
Median Weight	13.557	12.081	10.307	9.198	5.941	3.871	9.183	11.796

Figure 1. For Hire Survey Regions dividing up Florida (1 through 5). West of Florida was represented as a 0 and North of Florida was represented as a 6.

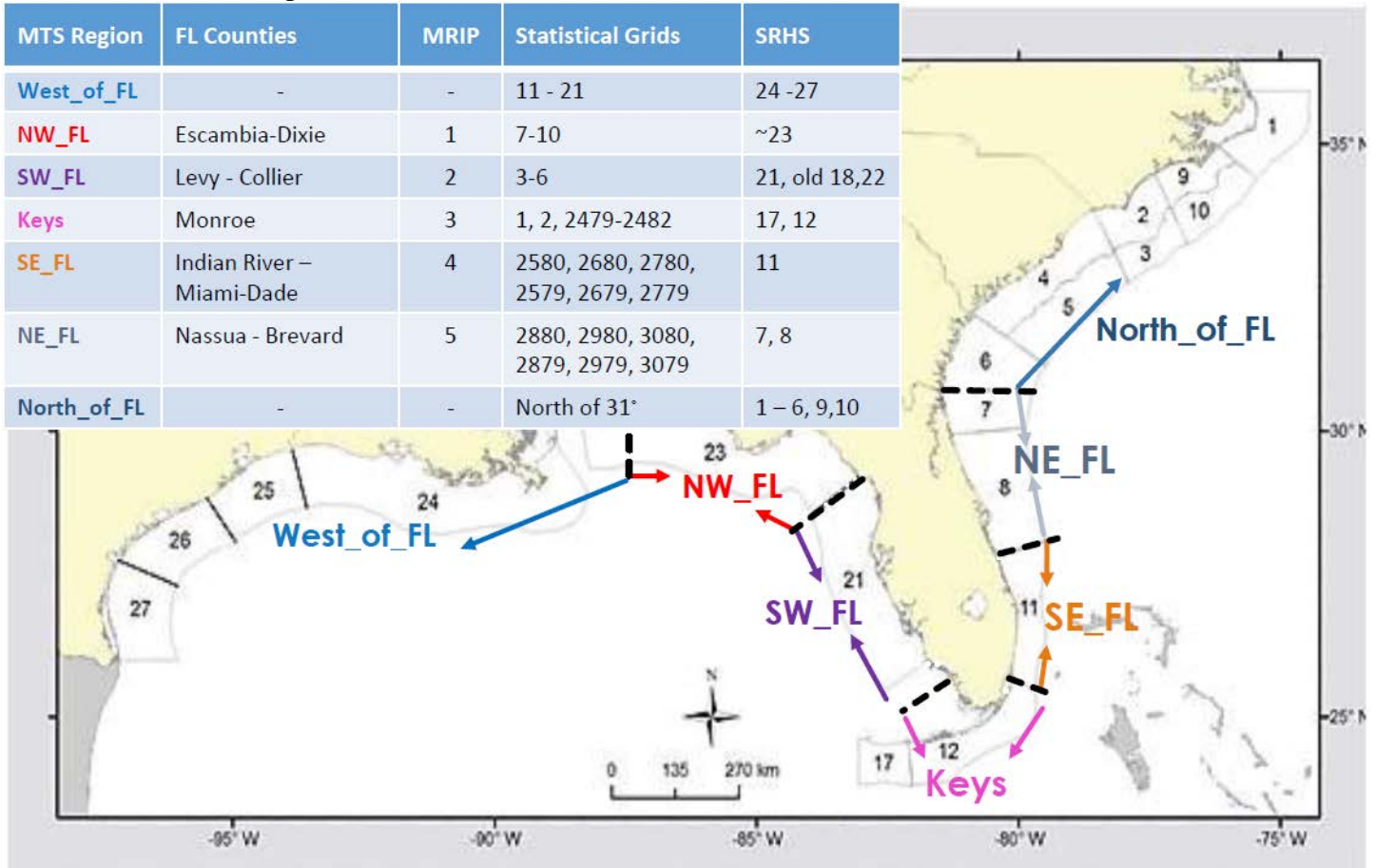


Figure 2a. Proportion of fork lengths by MTS region fished (Keys, Florida Northeast, Florida Northwest) using 1 cm bins.

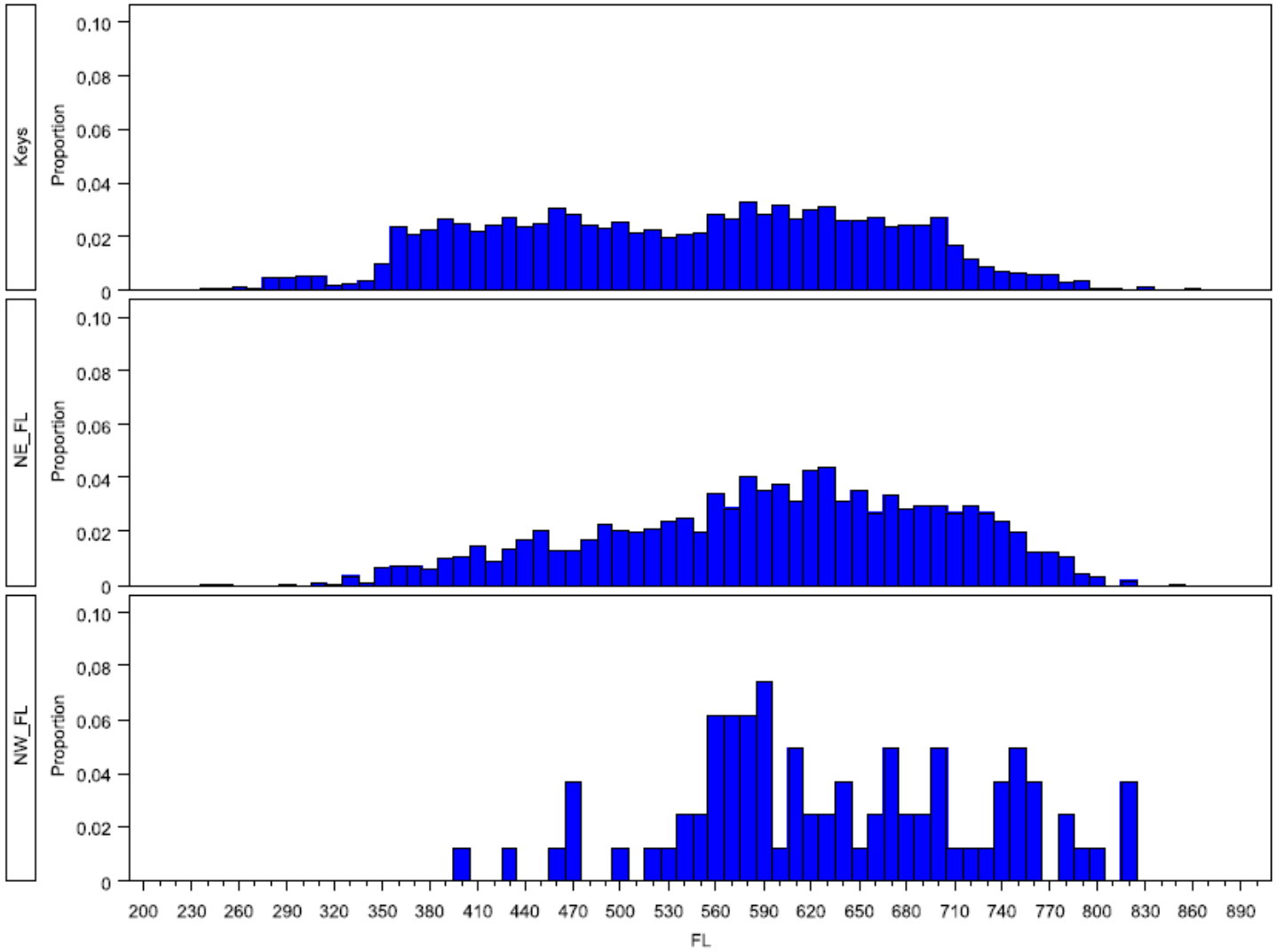


Figure 2b. Proportion of fork lengths by MTS region fished (North of Florida, Florida Southeast, Florida Southwest) using 1 cm bins.

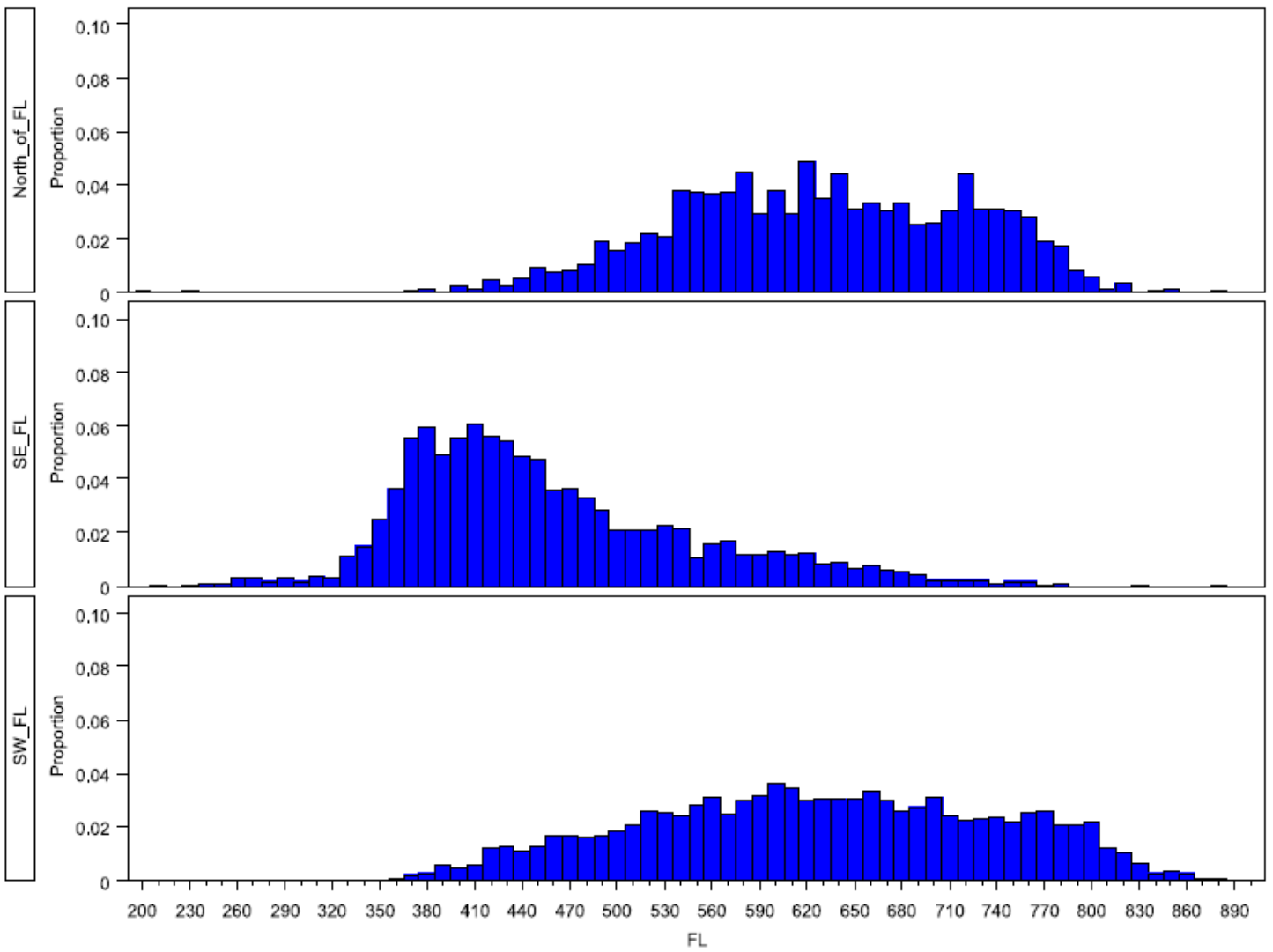


Figure 2c. Proportion of fork lengths by MTS region fished (Tortugas and West of Florida) using 1 cm bins.

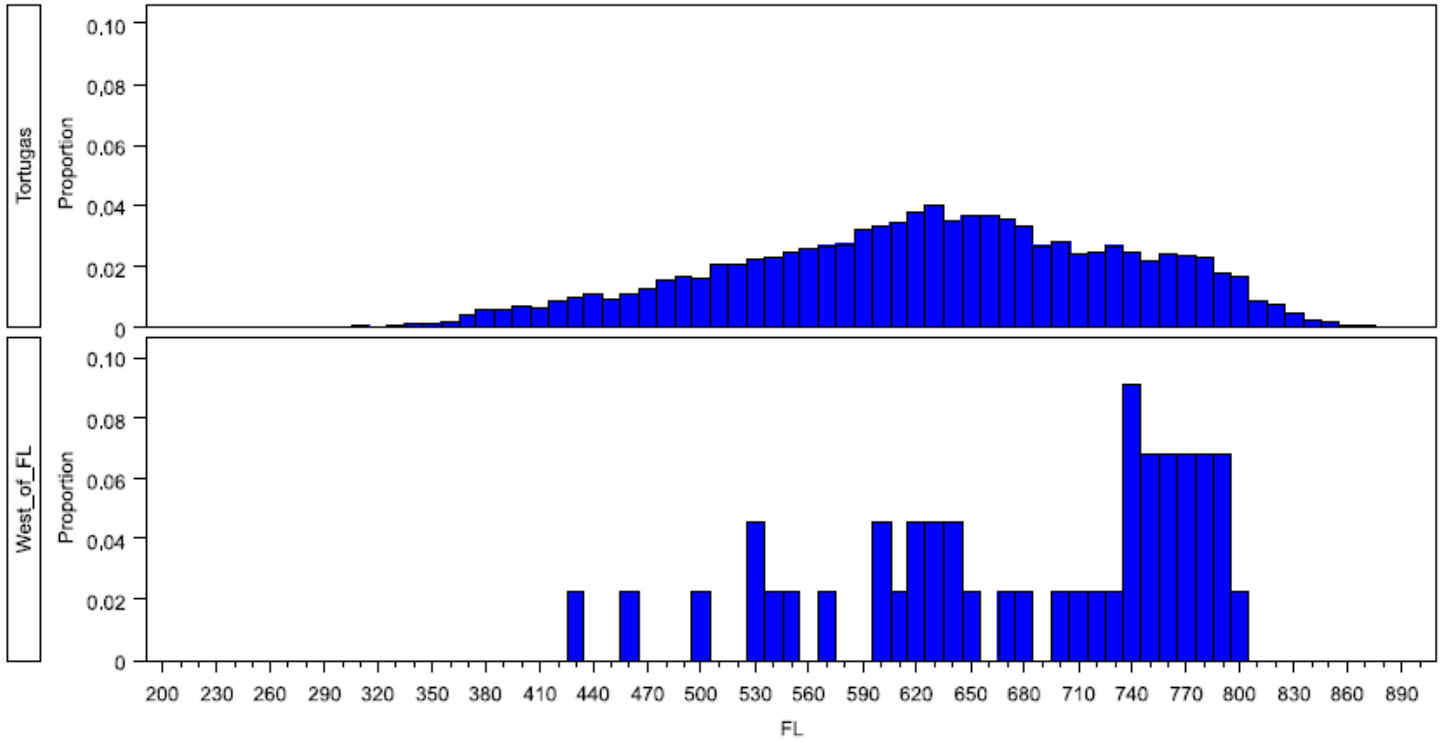


Figure 3a. Proportion of total lengths by MTS region fished (Keys, Florida Northeast, North of Florida) using 1 cm bins.

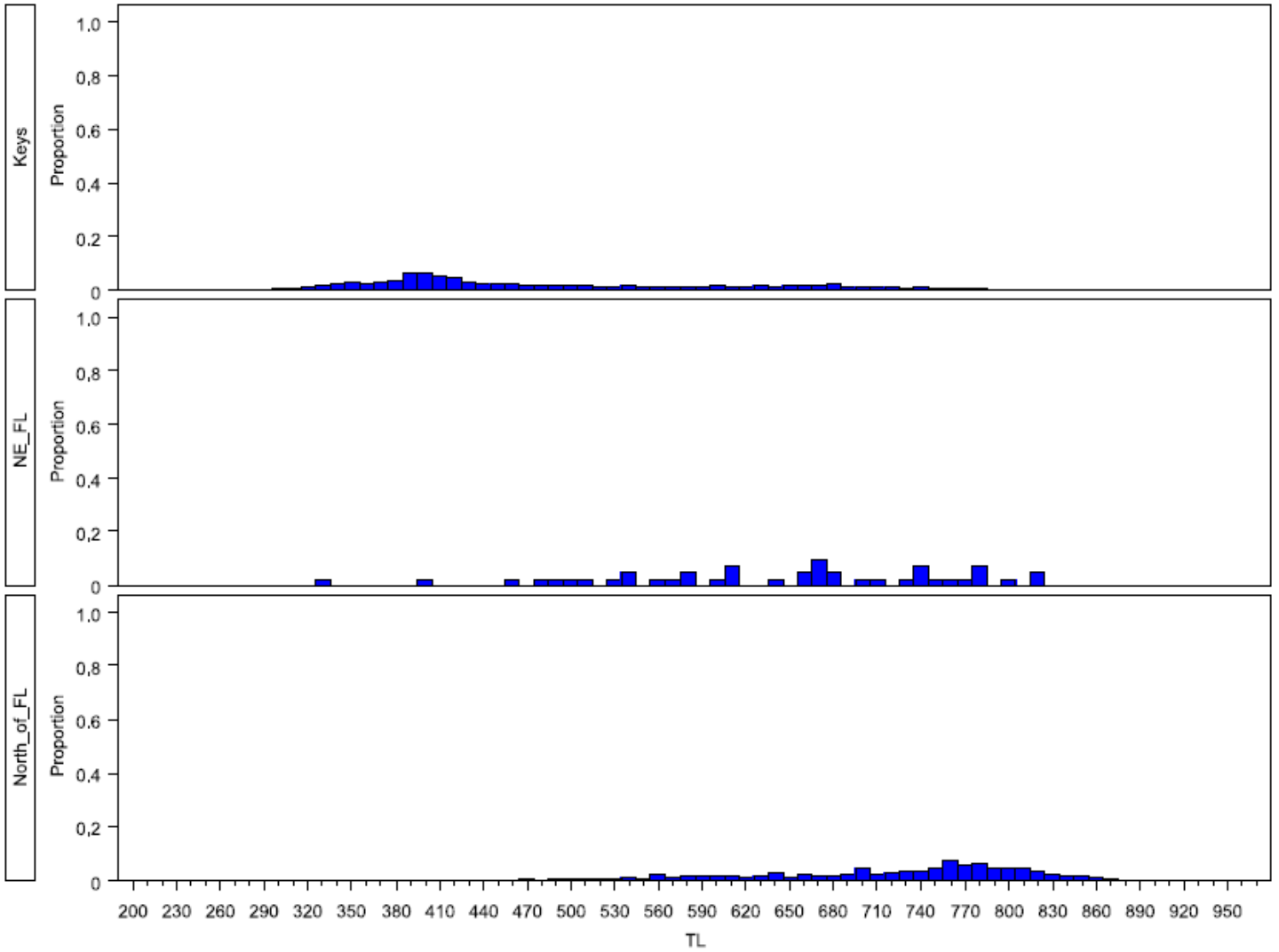


Figure 3b. Proportion of total lengths by MTS region fished (Florida Southeast, Florida Southwest, Tortugas) using 1 cm bins.

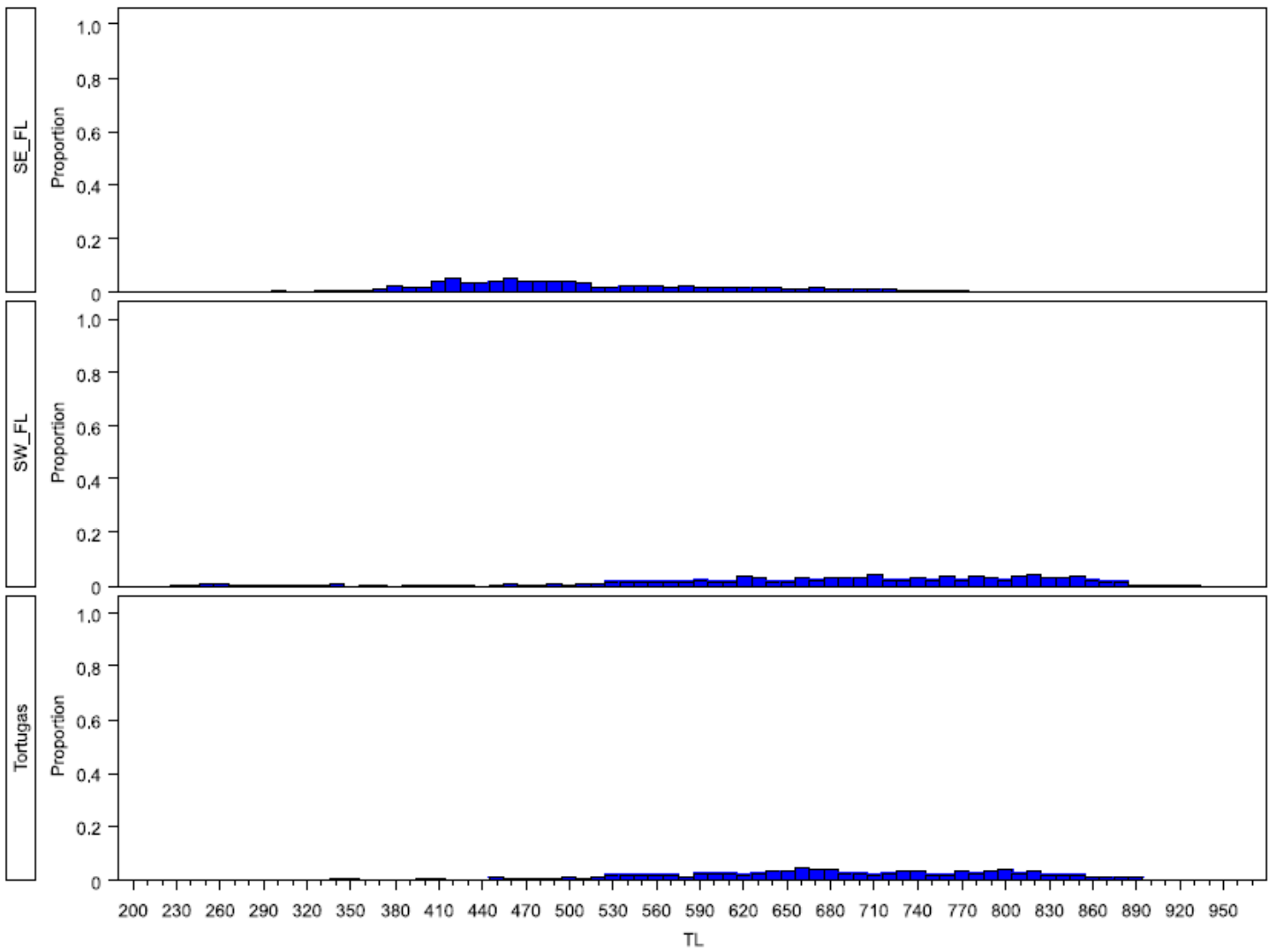


Figure 3c. Proportion of total lengths by MTS region fished (West of Florida) using 1 cm bins.

