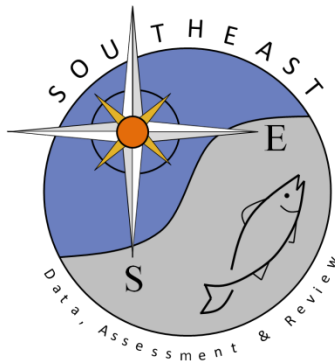


Morphometric conversions for great hammerhead *Sphyrna mokarran* and scalloped hammerhead *Sphyrna lewini* from the western North Atlantic Ocean and Gulf of Mexico

Lisa J. Natanson, Camilla T. McCandless William B. Driggers III, Eric R. Hoffmayer, Bryan S. Frazier, Carolyn N. Belcher, James Gelsleichter, Michelle S. Passerotti

SEDAR77-DW03

Received: 11/8/2021



*This information is distributed solely for the purpose of pre-dissemination peer review. It does not represent and should not be construed to represent any agency determination or policy.*

Please cite this document as:

Natanson, Lisa J., Camilla T. McCandless William B. Driggers III, Eric R. Hoffmayer, Bryan S. Frazier, Carolyn N. Belcher, James Gelsleichter, Michelle S. Passerotti. 2021. Morphometric conversions for great hammerhead *Sphyrna mokarran* and scalloped hammerhead *Sphyrna lewini* from the western North Atlantic Ocean and Gulf of Mexico. SEDAR77-DW03. SEDAR, North Charleston, SC. 4 pp.

Morphometric conversions for great hammerhead *Sphyrna mokarran* and scalloped hammerhead *Sphyrna lewini* from the western North Atlantic Ocean and Gulf of Mexico

Lisa J. Natanson<sup>1</sup>, Camilla T. McCandless<sup>2</sup>, William B. Driggers III<sup>3</sup>, Eric R. Hoffmayer<sup>3</sup>, Bryan S. Frazier<sup>4</sup>, Carolyn N. Belcher<sup>5</sup>, James Gelsleichter<sup>6</sup>, Michelle S. Passerotti<sup>2</sup>

<sup>1</sup> 53905 McBride Ave, Homer, AK 99603

<sup>2</sup> NOAA/NMFS/NEFSC Narragansett Laboratory, 28 Tarzwell Drive, Narragansett, RI 02882

<sup>3</sup> NOAA/NMFS/SEFSC Mississippi Laboratories, 3209 Frederic Street, Pascagoula, MS 39567

<sup>4</sup> South Carolina Department of Natural Resources, 217 Ft. Johnson Rd., Charleston, SC 29412

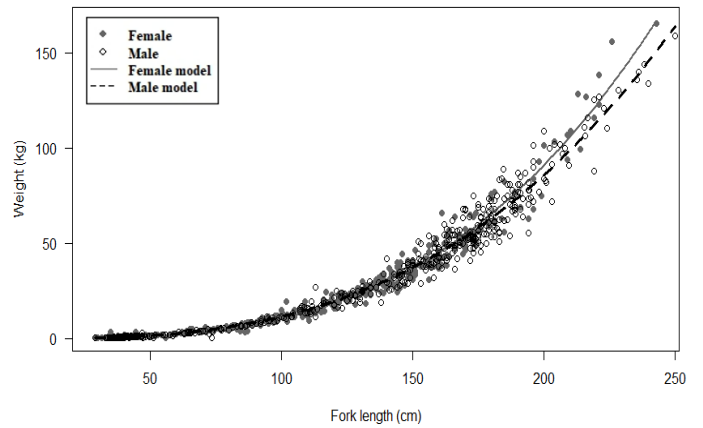
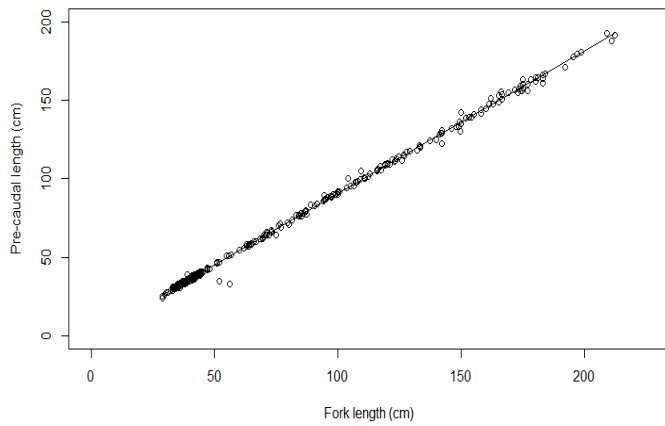
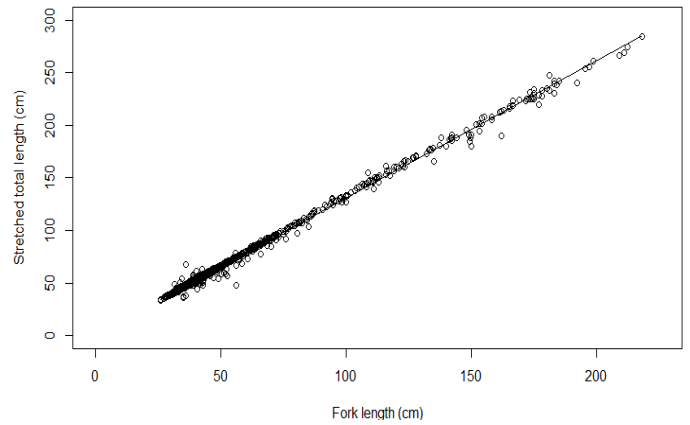
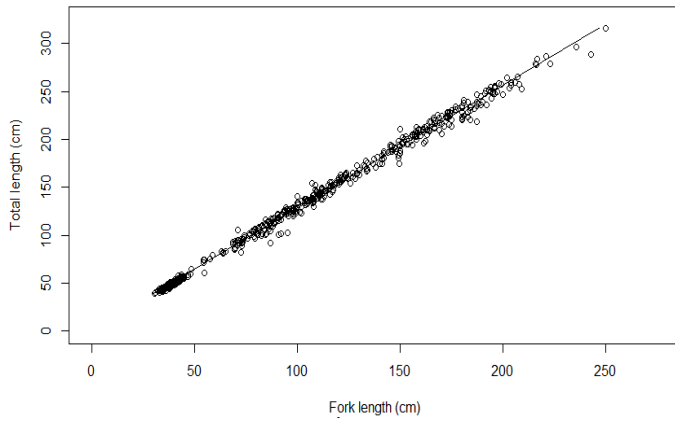
<sup>5</sup> Georgia Department of Natural Resources, Coastal Resources Division, Brunswick, GA 31520

<sup>6</sup> Department of Biology, University of North Florida, 1 UNF Drive, Jacksonville, FL 32224

## Summary

Morphometric conversion equations are presented for great hammerhead *Sphyrna mokarran* and scalloped hammerhead *Sphyrna lewini* sharks collected from the Gulf of Mexico and western North Atlantic Ocean. Equations are given for each species relating fork length (FL, cm) to total length (TL, cm), stretched total length (STL, cm), pre-caudal length (PCL, cm), and whole weight (kg). These data were derived from measurements of sharks sampled during research activities and from commercial and recreational fishermen between 1961-2018. Linear models in the form of  $Y = a + b \cdot FL$  were fitted for all length-length relationships pooled across sexes, where  $Y = TL, STL, \text{ or } PCL$ . Fork length – weight relationships were calculated separately for each sex and for sexes combined, and were fitted with power curves in the form of  $W = aL^b$  where  $W = \text{weight}$  and  $L = FL$ . All analyses were conducted using R (R Core Development Team 2020). For each species, a series of figures is presented depicting each length-length and length-weight relationship followed by tables containing sample size (n), measurement ranges, and model parameters for each morphometric conversion.

Summary of morphometric relationship parameters for scalloped hammerhead shark, *Sphyrna lewini*



Fork length - Total length

Sex	FL range (cm)	TL range (cm)	N	a	b	R <sup>2</sup>
Combined	30.5 – 250.0	33.0 – 316.0	534	0.218	1.281	0.995
Female	30.5 – 216.0	33.0 – 278.0	246	-	-	-
Male	32.0 – 250.0	40.5 – 316.0	285	-	-	-

Fork length - Stretched total length

Sex	FL range (cm)	STL range (cm)	N	a	b	R <sup>2</sup>
Combined	26.0-218.0	33.7-284.0	1969	0.596	1.305	0.997
Female	27.8-185.0	36.8-242.0	930	-	-	-
Male	26.0-218.0	33.7-284.0	1023	-	-	-

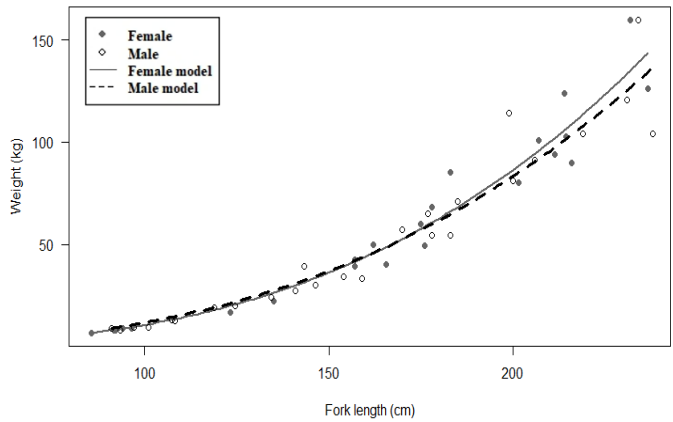
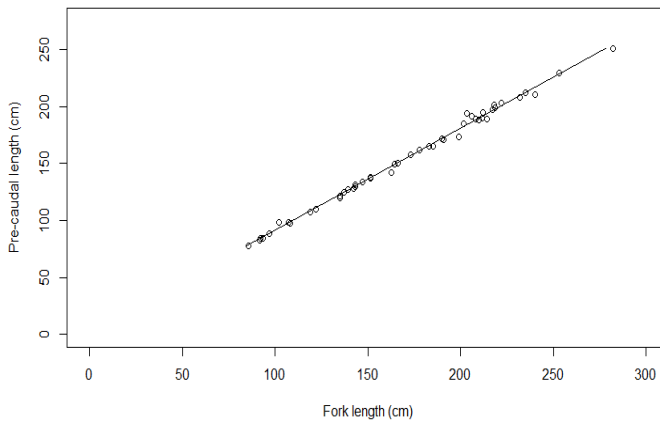
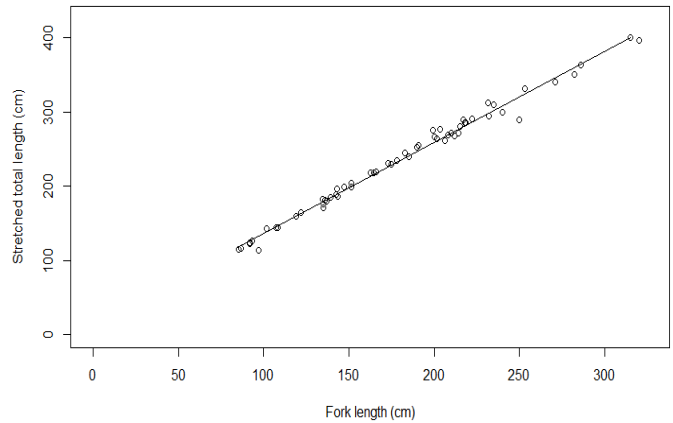
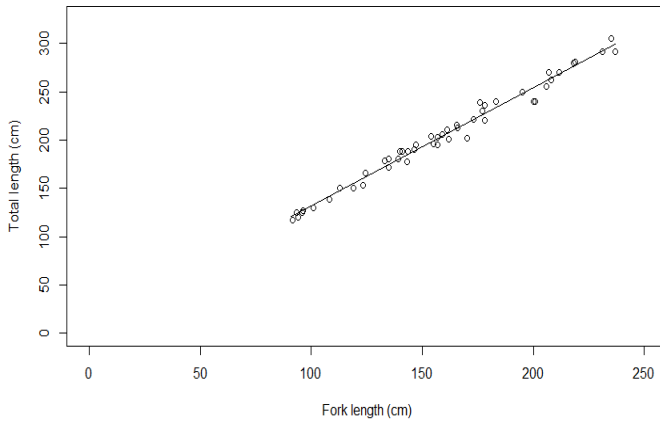
Fork length - Pre-caudal length

Sex	FL range (cm)	PCL range (cm)	N	a	b	R <sup>2</sup>
Combined	29.0-212.2	24.0-192.5	467	-0.265	0.909	0.999
Female	29.0-150.0	24.0-142.0	202	-	-	-
Male	29.0-212.2	25.5-192.5	260	-	-	-

Fork length - Weight

Sex	FL range (cm)	Weight range (kg)	N	a	b	RSE
Combined	29.0-250.0	0.15-165.6	932	1.161 e-5	2.988	4.96
Female	29.0-243.0	0.25-165.6	452	5.774 e-6	3.128	4.07
Male	29.0-250.0	0.15-158.8	474	1.778 e-5	2.905	5.51

Summary of morphometric relationship parameters for great hammerhead shark, *Sphyrna mokarran*



Fork length - Total length

Sex	FL range (cm)	TL range (cm)	N	a	b	R <sup>2</sup>
Combined	91.3-236.8	117.0-305.0	50	9.139	1.226	0.983
Female	91.3-236.8	117.0-291.5	23	-	-	-
Male	93.4-234.9	124.5-305.0	27	-	-	-

Fork length - Stretched total length

Sex	FL range (cm)	STL range (cm)	N	a	b	R <sup>2</sup>
Combined	85.5-315.0	113.5-400.0	58	14.13	1.227	0.989
Female	85.5-315.0	115.5-400.0	35	-	-	-
Male	93.4-282.0	113.5-350.0	21	-	-	-

Fork length - Pre-caudal length

Sex	FL range (cm)	PCL range (cm)	N	a	b	R <sup>2</sup>
Combined	85.5-282.0	78.0-251.0	47	1.652	0.895	0.996
Female	85.5-253.0	78.0-225.0	27	-	-	-
Male	93.4-282.0	84.5-251.0	20	-	-	-

Fork length - Weight

Sex	FL range (cm)	Weight range (kg)	N	a	b	RSE
Combined	85.5-238.0	6.4-160.0	50	1.691 e-5	2.912	11.2
Female	85.5-236.8	6.4-160.0	24	9.275 e-6	3.028	10.6
Male	91.0-238.0	8.0-160.0	26	2.482 e-5	2.836	12

