Cownose ray morphometric dataset documentation

This document is meant to serve as a reference for the file structure of the dataset concerning the external morphology and internal anatomy of cownose rays in the Gulf of Mexico. Data included originates from the United States waters of the western North Atlantic, including the United States waters of the Gulf of Mexico; the coastal waters of Suriname; and a single individual from the Museum of Comparative Zoology at Harvard University, originally collected off the coast of Brazil. Specimens from the GOM were collected from 2006 to 2012, during monthly or annual trawl and gillnet surveys conducted by, the Florida Fish and Wildlife Conservation Commission (FWC), the Dauphin Island Sea Laboratory (DISL), the University of Southern Mississippi's Gulf Coast Research Laboratory (GCRL), and the National Marine Fisheries Service (NMFS) Mississippi Laboratories. Additional Louisiana specimens were collected from a spearfishing tournament in 2012. Specimens from South Carolina, Georgia and the east coast of Florida were provided by the South Carolina Department of Natural Resources (SCDNR) in 2007. Specimens from Virginia were collected at the 2nd Annual Chesapeake Bay Stingray Tournament in June 2011 by researchers at Hood College.

Questions concerning the original data and its use may be directed to:

Christian Michael Jones
Research Fishery Biologist
National Marine Fisheries Service
Mississippi Laboratories
3209 Frederic Street
Pascagoula, MS 39568
Voice: 228-549-1614
Fax: 228-769-9200
christian.jones@noaa.gov

Datasets

There are three sheets in the excel file 'Cownose Master': Rhinoptera (ALL), skeletal measurements, and Glossary. The Rhinoptera (ALL) sheet contains information on where and when the specimens were collected, as well as the species designation, sex, morphometrics and meristics of all cownose rays examined. All measurements in the Rhinoptera (ALL) sheet are in millimeters (mm). The skeletal measurements sheet contains information about skeletal morphometrics and meristics for a subset of the specimens. All measurements in the skeletal

measurements sheet are in mm. The Glossary sheet contains information pertaining to the measurement and meristic codes or abbreviations used in the other two sheets.

The individual specimens on each sheet can be linked by the Specimen # [Rhinoptera (ALL) sheet] and Specimen ID (skeletal measurements sheet) variables, which are equivalent.

Rhinoptera (ALL) sheet structure

Variable – dataset variable name
Type – character (Char) or numeric (Num) variable

#	Variable	Type
1	Specimen #	Char
2	fin clip?	Char
3	sequenced?	Char
4	Morphometrics?	Char
5	State	Char
6	DOC	Num
7	Station	Char
8	Lon	Num
9	Lat	Num
10	Species	Char
11	Joe ID	Char
12	Sex	Char
13	Weight	Num
14	Disc Width	Num
15	Disc Length	Num
16	Morph 1	Num
17	Morph 2	Num
18	Morph 3	Num
19	Morph 4	Num
20	Morph 5	Num
21	Morph 6	Num
22	Morph 7	Num
23	Morph 8	Num
24	Morph 9	Num
25	Morph 10	Num
26	Morph 11	Num
27	Morph 12	Num
28	Morph 13	Num
29	Morph 14	Num
30	Morph 15	Num
31	Morph 16	Num
32	Morph 17	Num
33	Morph 18	Num
34	Morph 19	Num

#	Variable	Type
35	Morph 20	Num
36	Morph 21	Num
37	Morph 22	Num
38	Morph 23	Num
39	Morph 24	Num
40	Morph 25	Num
41	Morph 26	Num

Explanation of Rhinoptera (ALL) variables

Specimen #

Alpha numeric unique specimen identifier. Can be used to link data in sheets as this is the same identifier as Specimen ID in skeletal measurements sheet

fin clip?

Indicates whether a fin clip was taken from the specimen

Y=yes
N=no

sequenced?

Indicates whether a mitochondrial DNA (mtDNA) cytochrome-oxidase I (COI) sequence was generated for the specimen

Y=yes
N=no

Morphometrics?

Indicates whether measurements and counts were taken from the specimen

Y=yes
N=no

State

Indicates the state (US) or country (non-US) waters from which the specimen was collected

AL=Alabama
Brazil=Brazil
FL=Florida
GA=Georgia
LA=Louisiana
SC=South Carolina
TX=Texas
VA=Virginia
Suriname=Suriname

DOC

Date of capture in mm/dd/yyyy

Station

Collection locations of specimens. These can be very general (*e.g.* West Horn) or associated with a specific location (0420100290 sta.182) designated by the vessel code (04) survey number (20100290) and specific sampling location (182). In most cases, these are associated with the DOC (see previous) as well as the Lon and Lat (see next two variables).

Lon

Longitude in decimal degrees. West longitudes are negative.

Lat

Latitude in decimal degrees. South latitudes are negative.

Species

Initial species designation based on morphology (predominantly tooth counts). This is the same as Initial ID in the skeletal measurements sheet.

bonasus=*Rhinoptera bonasus*
brasiliensis=*Rhinoptera brasiliensis*

Joe ID

Species designation based on mtDNA COI sequence data. This is the same as the Joe ID field in the skeletal measurements sheet.

bonasus=*Rhinoptera bonasus*
brasiliensis=*Rhinoptera brasiliensis*

Sex

Sex of specimen

M=male
F=female

Weight

Weight of specimen in kg.

Disc Width

Width of the disc from the lateral apex of one pectoral fin to the lateral apex of the other (greatest width across disc) measured in mm. This is the same as DW in the skeletal measurements sheet.

Disc Length

Length of disc from origin of pectoral fin to pectoral fin free rear tip measured in mm

Morph 1

Length of Anterior Projection measured in mm

Morph 2

Dorsal Fin Length at Base measured in mm

Morph 3

Dorsal Fin Height measured in mm

Morph 4

Pre-Dorsal Distance measured in mm

Morph 5

Interorbital Distance measured in mm

Morph 6

Cranial Length measured in mm

Morph 7

Interspiracle Distance measured in mm

Morph 8

Pre-Oral Distance measured in mm

Morph 9

Internasal Distance measured in mm

Morph 10

Pre-Cloacal Distance measured in mm

Morph 11

Distance from Anterior Groove to Pelvic Fin measured in mm

Morph 12

Pelvic Fin Width measured in mm

Morph 13

Left 5th Gill Slit Length measured in mm

Morph 14

5th Interbranchial Distance measured in mm

Morph 15

Distance from Anterior Groove to Mid-Point of 5th Gill Slit measured in mm

Morph 16

Left 1st Gill Slit Length measured in mm

Morph 17

1st Interbranchial Distance measured in mm

Morph 18

Distance from Anterior Groove to Mid-Point of 1st Gill Slit measured in mm

Morph 19

Caudal Length measured in mm

Morph 20

Number of Tooth Series in Top Jaw. This is the same as Upper in the skeletal measurements sheet.

Morph 21

Number of Tooth Series in Bottom Jaw. This is the same as Lower in the skeletal measurements sheet.

Morph 22

Width of Top Central Tooth in Top Jaw measured in mm

Morph 23

Width of Top Central Tooth in Bottom Jaw measured in mm

Morph 24

Length of Top Central Tooth in Top Jaw measured in mm

Morph 25

Length of Top Central Tooth in Bottom Jaw measured in mm

Morph 26

Spiral Valve Turns

Skeletal measurements sheet structure

Variable – dataset variable name
Type – character (Char) or numeric (Num) variable

	Variable	*Type*
1	Specimen ID	Char
2	Initial ID	Char
3	Joe ID	Char
4	DW	Num
5	Upper	Num
6	Lower	Num
7	SBD	Num
8	SFD	Num
9	SCH	Num
10	SCA	Num
11	SCP	Num
12	ADF	Num
13	AVF	Num
14	PDF	Num
15	PVF	Num
16	CL	Num
17	CWS	Num
18	CWO	Num
19	CWA	Num
20	CBW	Num
21	CH	Num
22	AGW	Num
23	AGD	Num
24	SFW	Num
25	SFL	Num
26	FMV	Num
27	ISV	Num
28	TSV	Num
29	BF	Num
30	WSA	Num
31	WSP	Num
32	CSH	Num

	Variable	*Type*
33	CSL	Num
34	JW	Num
35	Notes	Char

Explanation of Skeletal measurements variables

Specimen ID

> Alpha numeric unique specimen identifier. Can be used to link data in sheets as this is the same identifier as Specimen# in Rhinoptera (ALL) sheet

Initial ID

Initial species designation based on morphology (predominantly tooth counts). This is the same as Species in the Rhinoptera (ALL) sheet.

> bonasus=Rhinoptera bonasus
> brasiliensis=Rhinoptera brasiliensis

Joe ID

Species designation based on mtDNA COI sequence data. This is the same as the Joe ID field in the Rhinoptera (ALL) sheet.

> bonasus=Rhinoptera bonasus
> brasiliensis=Rhinoptera brasiliensis

DW

Width of the disc from the lateral apex of one pectoral fin to the lateral apex of the other (greatest width across disc) measured in mm. This is the same as Disc Width in the Rhinoptera (ALL) sheet.

Upper

> Number of Tooth Series in Upper Jaw. This is the same as Morph 20 in the Rhinoptera (ALL) sheet.

Lower

Number of Tooth Series in Lower Jaw. This is the same as Morph 21 in the Rhinoptera (ALL) sheet.

SBD

Scapular bridge diameter measured in mm

SFD

Scapular foramen diameter measured in mm

SCH

Scapulo-coricoid height measured in mm

SCA

Scapulo-coricoid width (Anterior) measured in mm

SCP

Scapulo-coricoid width (Posterior) measured in mm

ADF

Anterior-dorsal fenestra diameter measured in mm

AVF

Anterior-ventral fenestra diameter measured in mm

PDF

Posterior-dorsal fenestra diameter measured in mm

PVF

Posterior-ventral fenestra diameter measured in mm

CL

Chondrocranium length measured in mm

CWS

Chondrocranium width at rostrum measured in mm

CWO

Chondrocranium width at occipital condyle measured in mm

CWA

Chondrocranium width at post orbital apperature measured in mm

CBW

Chondrocramium base width measured in mm

CH

Chondrocranium height at nasal capsules measured in mm

AGW

Anterior groove width measured in mm

AGD

Anterior groove depth measured in mm

SFW

Supracranial fontanel width (Anterior) measured in mm

SFL

Supracranial fontanel length measured in mm

FMV

Number of free monospondylous vertebrae

ISV

Number of intermediate vertebrae

TSV

Number of thoracolumbar synarcular vertebrae

BF

Number of basal foramina

WSA

Width of cervicothoracic synarcual (anterior) measured in mm

WSP

Width of cervicothoracic synarcual (posterior) measured in mm

CSH

Cervicothoracic synarcual height measured in mm

CSL

Cervicothoracic synarcual length measured in mm

JW

Jaw Width measured in mm

Notes

Specimen specific notes