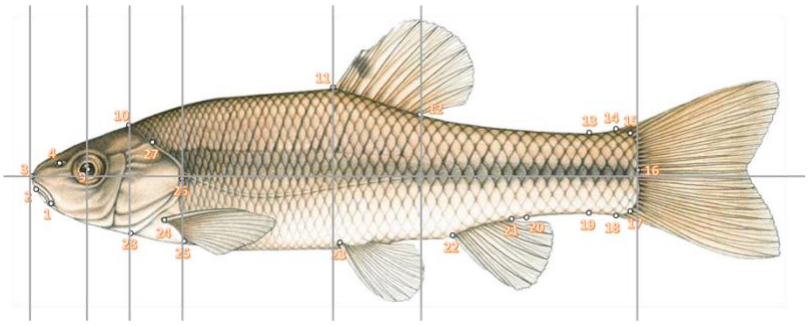
Data Dictionary for FishClim Data

This document lists variable names and their definitions



Landmark	Terminology
1	Posterior end of jaw
2	Opening of mouth
3	Tip of snout
4	Nostril
9	Center of the eye
10	Beginning of the scales at the dorsal side
11	Anterior insertion of the dorsal fin
12	Posterior insertion of dorsal fin
13	Waist - superior
14	Dorsal insertion of the caudal fin
15	Superior insertion of the caudal peduncle
16	End of vertebral column
17	Inferior insertion of the caudal peduncle
18	Ventral insertion of the caudal fin
19	Waist - inferior
20	Anus
21	Posterior insertion of the anal fin
22	Anterior insertion of the anal fin
23	Anterior insertion of the pelvic fin
24	Superior insertions of the pectoral fin
25	Inferior insertions of the pectoral fin
26	Most dorsal point of operculum
27	Most posterior point of operculum
28	Most ventral point of operculum

Figure 1: Landmark points #1-#28 on fish. Length and width measurements are units of pixels and are taken between points vertically and horizontally only. Refer to the table above to define the landmarks.

Figure 2: Computer vision segmentation of fish to identify areas for head, eye, trunk, and fins.

Variable	Definition
Angle_head	Angle of head as defined by points #10 #3 and #28 in Figure 1 with point #3 as the vertex.
BasinID	ID of Basin within the state from which the specimen was collected.
BasinName	Name associated with Basin ID and within the state from which the specimen was collected.
BB_Image	Raw image within bounded box of specimen.
Body_area	Body size: Number of pixels in dark teal and white area shown in Figure 2.
Body_length	Length of body: Distance in pixels between points #3 and #16 in Figure 1.
Body_width	Width of body: Distance in pixels between points #11 and #23 in Figure 1.
Dorsal_Fin_length	Length of dorsal fin: Distance in pixels between points #11 and #12 in Figure 1.
Eye_area	Eye size: Number of pixels in green area (within white) shown in Figure 2.
Eye_diameter	Width of eye: Distance in pixels across green area (within white) shown in Figure 2.
Family	Family of specimen.
Genus	Genus of specimen.
Head_area	Head size:Number of pixels in white area shown in Figure 2.
Head_length	Length of head: Distance in pixels between points #3 and #26 in Figure 1.
Head_width	Width of head: Distance in pixels between points #10 and #28 in Figure 1.
ID	Unique identifier of fish specimen.
Lat	Latitude of location from which the specimen was collected.
Loc_analFinOnBodyHoriz	Relative horizontal location of anal fin: LengthK/LengthL where LengthK=Distance in pixels between points #3 and #22 and LengthL=Distance in pixels between points #3 and #16.
Loc_dorsFinOnBodyHoriz	Relative horizontal location of dorsal fin: LengthG/LengthH where LengthG=Distance in pixels between points #3 and #11 and LengthH=Distance in pixels between points #3 and #16.
Loc_eyeOnHeadHoriz	Relative horizontal location of eye: LengthA/LengthB where LengthA=Distance in pixels between points #3 and #9 and LengthB=Distance in pixels between points #3 and #26.

Variable	Definition
Loc_eyeOnHeadVertical	Relative vertical location of eye: LengthC/LengthD where LengthC=Distance in pixels between points #10 and #9 and LengthD=Distance in pixels between points #10 and #28.
Loc_pelvFinOnBodyHoriz	Relative horizontal location of pelvic fin: LengthI/LengthJ where LengthI=Distance in pixels between points #3 and #23 and LengthJ=Distance in pixels between points #3 and #16.
Loc_snoutOnHeadVertical	Relative vertical location of snout: LengthE/LengthF where LengthE=Distance in pixels between points #10 and #3 and LengthF=Distance in pixels between points #10 and #28.
Locality	Location description within a given state from which the specimen was collected.
Lon	Longitude of location from which the specimen was collected.
Model	Climate data are summaries of observed data. This model was used for an argument in Hydroclim.org to extract the observed data.
NewImageCount	Number of specimans available to create this dataset. Summary statistics taken from first 20 of these images.
Ratio_bodyLenByBodyWid	Ratio: Body_length/Body_width
Ratio_bodyWidthByhHeadWidth	Ratio: LengthO/LengthP where LengthO=Distance in pixles between points #11 and #23 and LengthP=Distance in pixles between points #10 and #28.
Ratio_dorsFinLenByBodyLen	Ratio: Dorsal_Fin_length/Body_length
Ratio_eyeAreaByHeadArea	Ratio: Eye_area/Head_area
Ratio_eyeDiamByHeadWid	Ratio: Eye_diameter/Head_width
Ratio_headAreaByBodyArea	Ratio: Head_area/Body_area
Ratio_headLenByBodyLen	Ratio:Head_length/Body_length
Ratio_headLenByTrunkLen	Ratio: Head_length/Trunk_length
Ratio_headWidthByBodyWid	Ratio: Head_width/Body_width
Ratio_snout2EyeLenByHeadLen	Ratio: Snout_to_Eye/Head_length
Ratio_trunkAreaByBodyArea	Ratio: Trunk_area/Body_area
Ratio_trunkLenByBodyLen	Ratio: Trunk_length/Body_length
ScientificName	Scientific name of specimen.
Score	Proxy for how similar measurements from image specimen are to the entire collection average. It is the average of differences for each specimen measurement to its respective average.
SEG_Image	Segmented image of specimen.

Variable	Definition
Snout_to_Eye	Snout and eye separation: Distance in pixels between points #3 and #9 in Figure 1.
State	State from which the specimen was collected.
SubbasinID	ID of Sub-Basin within basin and state from which the specimen was collected.
Trunk_area	Trunk size: Number of pixels in dark teal area shown in Figure 2.
Trunk_length	Length of trunk: Distance in pixels between points #26 and #16 in Figure 1.
Wkt_filename	The name of the file provided by hydroclim.org that merge with fish Lat and Lon.
Y1950_faAvgFlow	Fall (Aug-Oct) observed average stream flow (m^3/s) for year 1950.
Y1950_faAvgWtrTemp	Fall (Aug-Oct) observed average water temperature (C) for year 1950.
Y1950_faMaxFlow	Fall (Aug-Oct) observed maximum stream flow (m^3/s) for year 1950.
Y1950_faMaxWtrTemp	Fall (Aug-Oct) observed maximum water temperature (C) for year 1950.
Y1950_faMinFlow	Fall (Aug-Oct) observed minimum stream flow (m^3/s) for year 1950.
Y1950_faMinWtrTemp	Fall (Aug-Oct) observed minimum water temperature (C) for year 1950.
Y1950_spAvgFlow	Spring (May-July) observed average stream flow (m^3/s) for year 1950.
Y1950_spAvgWtrTemp	Spring (May-July) observed average water temperature (C) for year 1950.
Y1950_spMaxFlow	Spring (May-July) observed maximum stream flow (m^3/s) for year 1950.
Y1950_spMaxWtrTemp	Spring (May-July) observed maximum water temperature (C) for year 1950.
Y1950_spMinFlow	Spring (May-July) observed minimum stream flow (m^3/s) for year 1950.
Y1950_spMinWtrTemp	Spring (May-July) observed minimum water temperature (C) for year 1950.
Y1960_faAvgFlow	Fall (Aug-Oct) observed average stream flow (m^3/s) for year 1960.
Y1960_faAvgWtrTemp	Fall (Aug-Oct) observed average water temperature (C) for year 1960.
Y1960_faMaxFlow	Fall (Aug-Oct) observed maximum stream flow (m^3/s) for year 1960.
Y1960_faMaxWtrTemp	Fall (Aug-Oct) observed maximum water temperature (C) for year 1960.

Variable	Definition
Y1960_faMinFlow	Fall (Aug-Oct) observed minimum stream flow (m^3/s) for year 1960.
Y1960_faMinWtrTemp	Fall (Aug-Oct) observed minimum water temperature (C) for year 1960.
Y1960_spAvgFlow	Spring (May-July) observed average stream flow (m^3/s) for year 1960.
Y1960_spAvgWtrTemp	Spring (May-July) observed average water temperature (C) for year 1960.
Y1960_spMaxFlow	Spring (May-July) observed maximum stream flow (m^3/s) for year 1960.
Y1960_spMaxWtrTemp	Spring (May-July) observed maximum water temperature (C) for year 1960.
Y1960_spMinFlow	Spring (May-July) observed minimum stream flow (m^3/s) for year 1960.
Y1960_spMinWtrTemp	Spring (May-July) observed minimum water temperature (C) for year 1960.
Y1970_faAvgFlow	Fall (Aug-Oct) observed average stream flow (m^3/s) for year 1970.
Y1970_faAvgWtrTemp	Fall (Aug-Oct) observed average water temperature (C) for year 1970.
Y1970_faMaxFlow	Fall (Aug-Oct) observed maximum stream flow (m^3/s) for year 1970.
Y1970_faMaxWtrTemp	Fall (Aug-Oct) observed maximum water temperature (C) for year 1970.
Y1970_faMinFlow	Fall (Aug-Oct) observed minimum stream flow (m^3/s) for year 1970.
Y1970_faMinWtrTemp	Fall (Aug-Oct) observed minimum water temperature (C) for year 1970.
Y1970_spAvgFlow	Spring (May-July) observed average stream flow (m^3/s) for year 1970.
Y1970_spAvgWtrTemp	Spring (May-July) observed average water temperature (C) for year 1970.
Y1970_spMaxFlow	Spring (May-July) observed maximum stream flow (m^3/s) for year 1970.
Y1970_spMaxWtrTemp	Spring (May-July) observed maximum water temperature (C) for year 1970.
Y1970_spMinFlow	Spring (May-July) observed minimum stream flow (m^3/s) for year 1970.
Y1970_spMinWtrTemp	Spring (May-July) observed minimum water temperature (C) for year 1970.
Y1980_faAvgFlow	Fall (Aug-Oct) observed average stream flow (m^3/s) for year 1980.

Variable	Definition
Y1980_faAvgWtrTemp	Fall (Aug-Oct) observed average water temperature (C) for year 1980.
Y1980_faMaxFlow	Fall (Aug-Oct) observed maximum stream flow (m^3/s) for year 1980.
Y1980_faMaxWtrTemp	Fall (Aug-Oct) observed maximum water temperature (C) for year 1980.
Y1980_faMinFlow	Fall (Aug-Oct) observed minimum stream flow (m^3/s) for year 1980.
Y1980_faMinWtrTemp	Fall (Aug-Oct) observed minimum water temperature (C) for year 1980.
Y1980_spAvgFlow	Spring (May-July) observed average stream flow (m^3/s) for year 1980.
Y1980_spAvgWtrTemp	Spring (May-July) observed average water temperature (C) for year 1980.
Y1980_spMaxFlow	Spring (May-July) observed maximum stream flow (m^3/s) for year 1980.
Y1980_spMaxWtrTemp	Spring (May-July) observed maximum water temperature (C) for year 1980.
Y1980_spMinFlow	Spring (May-July) observed minimum stream flow (m^3/s) for year 1980.
Y1980_spMinWtrTemp	Spring (May-July) observed minimum water temperature (C) for year 1980.
Y1990_faAvgFlow	Fall (Aug-Oct) observed average stream flow (m^3/s) for year 1990.
Y1990_faAvgWtrTemp	Fall (Aug-Oct) observed average water temperature (C) for year 1990.
Y1990_faMaxFlow	Fall (Aug-Oct) observed maximum stream flow (m^3/s) for year 1990.
Y1990_faMaxWtrTemp	Fall (Aug-Oct) observed maximum water temperature (C) for year 1990.
Y1990_faMinFlow	Fall (Aug-Oct) observed minimum stream flow (m^3/s) for year 1990.
Y1990_faMinWtrTemp	Fall (Aug-Oct) observed minimum water temperature (C) for year 1990.
Y1990_spAvgFlow	Spring (May-July) observed average stream flow (m^3/s) for year 1990.
Y1990_spAvgWtrTemp	Spring (May-July) observed average water temperature (C) for year 1990.
Y1990_spMaxFlow	Spring (May-July) observed maximum stream flow (m^3/s) for year 1990.
Y1990_spMaxWtrTemp	Spring (May-July) observed maximum water temperature (C) for year 1990.

Variable	Definition
Y1990_spMinFlow	Spring (May-July) observed minimum stream flow (m^3/s) for year 1990.
Y1990_spMinWtrTemp	Spring (May-July) observed minimum water temperature (C) for year 1990.
Y2000_faAvgFlow	Fall (Aug-Oct) observed average stream flow (m^3/s) for year 2000.
Y2000_faAvgWtrTemp	Fall (Aug-Oct) observed average water temperature (C) for year 2000.
Y2000_faMaxFlow	Fall (Aug-Oct) observed maximum stream flow (m^3/s) for year 2000.
Y2000_faMaxWtrTemp	Fall (Aug-Oct) observed maximum water temperature (C) for year 2000.
Y2000_faMinFlow	Fall (Aug-Oct) observed minimum stream flow (m^3/s) for year 2000.
Y2000_faMinWtrTemp	Fall (Aug-Oct) observed minimum water temperature (C) for year 2000.
Y2000_spAvgFlow	Spring (May-July) observed average stream flow (m^3/s) for year 2000.
Y2000_spAvgWtrTemp	Spring (May-July) observed average water temperature (C) for year 2000.
Y2000_spMaxFlow	Spring (May-July) observed maximum stream flow (m^3/s) for year 2000.
Y2000_spMaxWtrTemp	Spring (May-July) observed maximum water temperature (C) for year 2000.
Y2000_spMinFlow	Spring (May-July) observed minimum stream flow (m^3/s) for year 2000.
Y2000_spMinWtrTemp	Spring (May-July) observed minimum water temperature (C) for year 2000.
Y2010_faAvgFlow	Fall (Aug-Oct) observed average stream flow (m^3/s) for year 2010.
Y2010_faAvgWtrTemp	Fall (Aug-Oct) observed average water temperature (C) for year 2010.
Y2010_faMaxFlow	Fall (Aug-Oct) observed maximum stream flow (m^3/s) for year 2010.
Y2010_faMaxWtrTemp	Fall (Aug-Oct) observed maximum water temperature (C) for year 2010.
Y2010_faMinFlow	Fall (Aug-Oct) observed minimum stream flow (m^3/s) for year 2010.
Y2010_faMinWtrTemp	Fall (Aug-Oct) observed minimum water temperature (C) for year 2010.
Y2010_spAvgFlow	Spring (May-July) observed average stream flow (m^3/s) for year 2010.

Variable	Definition
Y2010_spAvgWtrTemp	Spring (May-July) observed average water temperature (C) for year 2010.
Y2010_spMaxFlow	Spring (May-July) observed maximum stream flow (m^3/s) for year 2010.
Y2010_spMaxWtrTemp	Spring (May-July) observed maximum water temperature (C) for year 2010.
Y2010_spMinFlow	Spring (May-July) observed minimum stream flow (m^3/s) for year 2010.
Y2010_spMinWtrTemp	Spring (May-July) observed minimum water temperature (C) for year 2010.
Y2020_faAvgFlow	Fall (Aug-Oct) observed average stream flow (m^3/s) for year 2020.
Y2020_faAvgWtrTemp	Fall (Aug-Oct) observed average water temperature (C) for year 2020.
Y2020_faMaxFlow	Fall (Aug-Oct) observed maximum stream flow (m^3/s) for year 2020.
Y2020_faMaxWtrTemp	Fall (Aug-Oct) observed maximum water temperature (C) for year 2020.
Y2020_faMinFlow	Fall (Aug-Oct) observed minimum stream flow (m^3/s) for year 2020.
Y2020_faMinWtrTemp	Fall (Aug-Oct) observed minimum water temperature (C) for year 2020.
Y2020_spAvgFlow	Spring (May-July) observed average stream flow (m^3/s) for year 2020.
Y2020_spAvgWtrTemp	Spring (May-July) observed average water temperature (C) for year 2020.
Y2020_spMaxFlow	Spring (May-July) observed maximum stream flow (m^3/s) for year 2020.
Y2020_spMaxWtrTemp	Spring (May-July) observed maximum water temperature (C) for year 2020.
Y2020_spMinFlow	Spring (May-July) observed minimum stream flow (m^3/s) for year 2020.
Y2020_spMinWtrTemp	Spring (May-July) observed minimum water temperature (C) for year 2020.
YearCollected	Year the specimen was collected.