

Appendix I5

Benthics Raw Data Source Description

Lower Hillsborough River Recovery Strategy - Master Benthic Macroinvertebrate Data README

Southwest Florida Water Management District

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Summary

This document summarizes the benthic macroinvertebrate data used to construct the benthic macroinvertebrate master dataset for the Lower Hillsborough River (LHR) for the period of January 1, 1996 to December 31, 2023. This is part of the Task 10 data deliverable for Task Work Assignment 22TW0003992.

This document is produced using R software code that reads in datasets provided by the District as well as additional data found by Frydenborg Ecologic LLC, and combines the data into a master dataset.

README documentation is provided within each section, divided by data source, within this file.

Johnson, Mirmiran, & Thompson (JMT)

File Name and path: /JMT/Benthics/JMT_Benthics_consolidated.xlsx

This is a spreadsheet of benthic species collected by dredge on seven events by JMT between 2020 and 2023. Ponar dredge used to sample, and the area sampled (0.023 m² effort) was used to convert to a count per m² for the result.

The source for this data is Data/JMT/Benthics in SharePoint.

The seven individual excel spreadsheets were combined manually (copy paste to single document). These files were:

- Benthics_2020_Fall_Data
- Benthics_2020_Spring_Data
- Benthics_2021_Spring_Data
- Benthics_2022_Spring_Data
- Benthics_2023_Spring_Data
- Benthics_2023_Summer_Data
- Benthics_2023_Winter_Data

These data were last modified 06/26/2024 downloaded 06/26/2024. The period of record for this data is 2020 – 2023.

Data are counts of species identified to lowest practical taxonomic unit.

source	n site-dates	n dates	n sites	n taxa
JMT	58	7	10	105

Tampa Bay Water

File Name: /TBW_HBMP/Data_Download_20230815/Benthic/HBMP Benthic Archive Database_200731.accs

This is a Microsoft Access database of data collected by the Tampa Bay Water hydrobiological monitoring program. This program was conducted from June 2000 through June 2011 in the Hillsborough and several other tributaries and embayments in eastern Tampa Bay, Florida.

The source for these data is Data/TBW_HBMP/Data_Download_20230815/Benthic/ in SharePoint.

The following database sheets were exported from the database as xlsx files and then read into R:

- Benthic_Data
- Benthic_Deploy
- Benthic_Taxa_List

These data were last modified 9/05/2023 and downloaded 9/06/2023.

Data are provided as counts of species identified to lowest practical taxonomic unit.

A van veen sampler was used to sample (0.04 m²). Observations were divided by this effort to calculate a number per m².

source	n site-dates	n dates	n sites	n taxa
TBW HBMP	207	60	200	220

Flannery

File Name: /S_Flannery/Benthic_MacInvert/Lower Hillsborough BioRecon data, winter 2021 to spring 2023.xlsx

This is a spreadsheet of benthic macroinvertebrate data collected by Sid Flannery between 2021 and 2023.

The source for this data is Data/S_Flannery/Benthic_MacInvert/ in Sharepoint.

Data are qualitative, not quantitative, and cannot be used for quantitative analyses. Species will be used for assessment of taxa, sensitivity, and other qualitative methods.

source	n site-dates	n dates	n sites	n taxa
Flannery	18	5	4	40

Hillsborough County Environmental Protection Commission (EPC)

File Name and path: /EPC/Benthics/EPC HR Benthic 1995-2009.xlsx

This is a spreadsheet of benthic species collected by dredge by EPC between 1995 and 2009.

The source for this data is Data/EPC/Benthics in SharePoint.

These data were last modified 9/5/2023 and downloaded 9/6/2023.

Data only have a year associated with them, no date. When data were filtered for only observations occurring within target area, several years had no data associated with them (e.g. 1997, 2002, 2009).

A van veen sampler was used to sample (0.04 m²). Observations were divided by this effort to calculate a number per m².

source	n site-year	n years	n sites	n taxa
EPC	69	12	12	171

Water and Air Research, Inc. (WAR)

File Name and path: /WAR/Second_FiveYear_Assess/Biology/Benthic Macroinverts 30 Day No Flow w WQ w Combinations.xlsx

The source for these data is Data/WAR/Second_FiveYear_Assess/Biology in SharePoint.

This is a spreadsheet of benthic species collected by TBW/HBMP from 2000-2011 and reduced to days of no flow over the dam, as well as the data collected by WAR in 2018. This data sheet contains duplicates, and the data are not included in the master data set. These data were last modified 7/31/2023 and downloaded 8/23/2023.

Data are provided as counts of species identified to lowest practical taxonomic unit.

File name: /WAR/Bio_2018/Appendix J2 - BENTHIC MACROINVERTEBRATE COUNT DATA — FIRST EVENT - April 2018.xlsx

The source for these data is Data/WAR/Bio_2018 in SharePoint.

This is a spreadsheet of benthic species collected by dredge by WAR in 2018.

Ponar dredge used to sample and 0.023 used to convert to count per m2.

File name: /WAR/Bio_2018/Appendix J3 - BENTHIC MACROINVERTEBRATE COUNT DATA — SECOND EVENT - May 2018.xlsx

The source for these data is Data/WAR/Bio_2018 in SharePoint.

This is a spreadsheet of benthic species collected by dredge by WAR in 2018

Ponar dredge used to sample and 0.023 used to convert to count per m2.

source	n site-dates	n dates	n sites	n taxa
WAR	12	2	6	69

FDEP Additional Data

File Name: /FDEP/SBIO_HD_taxa.csv, and /FDEP/SBIO_SCI_dipnet_taxa.csv

FDEP staff provided biological data in the Hillsborough River from their Statewide Biological Database (SBIO) as text files. These data were gathered using Rapid Periphyton Surveys, Ponar dredges, Stream Condition Index, Hester-Dendy (HD) deployments, Lake Vegetation Surveys. They also provided accompanying phys/chem for the sampling dates.

These data were first evaluated spatially. This evaluation found that one SCI event had been conducted in the Upper river segment, but the other SCIs were too far upstream. An HD sample was also located in the upper river segment, but other ponar data were further upstream. Both HD and SCI were collected on the same date.

source	n site-dates	n dates	n sites	n taxa
SBIO	2	1	2	30

Water Management District

Morris Bridge Sink Data

File Name: /FrEco/MBS Consolidated Bio.xlsx

Benthic macroinvertebrate data from yearly sampling PDF reports were extracted and placed into a consolidated excel file, and added to the master data set.

Combining of Data Sets

Each data set was manipulated within R to have columns of:

- Date - the date of observation
- Year - the year of observation
- Site - the distinct site identifier
- Final Taxa - the synonymized taxa name
- n - the number observed
- result_m2 - the number standardized by effort (m2)
- Source - the source of the data
- Location - a filtering column for data from MBS or LHR
- datatype - qualitative or quantitative data
- River Segment - Upper, Middle, Lower
- MFL Period - Period 1, 2, 3, 4, or 5
- Freshwater - Freshwater designations ("Fresh") in this column were derived from the Florida Department of Environmental Protection (FDEP) Statewide Biological Database designations.
- salin_tolerance - Literature associated values of salinity for taxa
- class - Literature associated water classifications for taxa.

The data sets were then combined into one file using bind_rows().

Species synonymy

File Name and path: /FrEco/Benthic Synonymy Ecology Final.xlsx

The preliminary Master data set was used to create a distinct table of taxa. These were manually examined for duplicates (misspellings, etc). A look up table was created based on that exercise and used to finalize species names.

Distinct Benthic Species

Final Taxa

Ablabesmyia cinctipes

Ablabesmyia mallochi

Ablabesmyia rhamphe grp.

Ablabesmyia sp.

Acteocina canaliculata

Aeshnidae

Alitta succinea

Almyracuma bacescui

Americamysis almyra

Americamysis stucki

Ampelisca abdita

Ampelisca holmesi

Ampelisca sp.

Amphibalanus eburneus

Amphibalanus spp.

Amphibalanus subalbidus

Amphibalanus venustus

Amphicteis floridus

Amygdalum papyrium

Ancylidae

Anopsilana jonesi

Anthoathecata sp.

Anthozoa sp.

Aoridae sp.

Apedilum sp.

Aphylla williamsoni

Argia

Argia sedula

Arhynchobdellida sp.

Aricidea sp.

Asheum beckae

Astyris lunata

Aulodrilus pigueti

Aulophorus furcatus

Final Taxa

Axarus sp.
Baetidae
Balanus subalbidus
Berosus sp.
Bezzia/Palpomyia grp.
Bivalvia
Bocardiella sp.
Boccardiella ligerica
Bodotriidae sp.
Boonea impressa
Brachyura sp.
Branchiobdellidae
Branchiostoma floridae
Branchiura sowerbyi
Bratislavia dadayi
Bratislavia unidentata
Bryozoa
Caenis amica
Caenis diminuta
Caenis sp.
Callibaetis sp.
Capitella capitata sp. complex
Capitella sp.
Carazziella hobsonae
Cassidinidea ovalis
Cerapus sp. C of LeCroy, 2007
Ceratopogonide
Ceriodaphnia sp.
Chaoborus punctipennis
Chaoborus sp.
Chironomidae
Chironomus decorus grp.
Chironomus sp.
Cirolana
Cirolana cf. jonesi

Final Taxa

Cirolana parva
Cirripedia
Cladopelma sp.
Cladotanytarsus sp.
Cladotanytarsus sp. F
Clinotanypus sp.
Clitellata w/proboscis
Clymenella mucosa
Cnidaria (LPIL)
Coelotanypus concinnus grp.
Coelotanypus sp.
Coenagrionidae
Collembola
Corbicula fluminea
Corynoneura sp.
Cricotopus bicinctus
Crustipellis tribanchiata
Cryptochironomus sp.
Cryptotendipes sp.
Ctenostomata sp.
Culicoides sp.
Cyathura polita
Cyclaspis varians
Cyprideis littoralis
Cyrenoida floridana
Cyrnellus fraternus
Daphnia sp.
Dasyhelea sp.
Dero digitata
Dero flabelliger
Dero furcata
Dero nivea
Dero obtusa
Dero pectinata
Dero sp.

Final Taxa

Dero trifida
Dicrotendipes lobus
Dicrotendipes modestus
Dicrotendipes neomodestus
Dicrotendipes nervosus
Dicrotendipes simpsoni
Dicrotendipes sp.
Dipolydora socialis
Dipolydora/Boccardiella grp.
Diptera
Djalmabatista pulcher
Djalmabatista pulcher variant
Djalmabatista sp.
Dubiraphia sp.
Dubiraphia vittata
Eclipidrilus sp.
Edotia montosa
Edotia triloba
Enallagma coecum
Enallagma sp.
Enchytraeidae
Entomobryidae
Ephemeroptera
Epitheca sp.
Erpobdella punctata
Erpobdella sp.
Eteone heteropoda
Eudendrium sp.
Euhirudinea sp.
Euplana gracilis
Eurytium limosum
Exosphaeroma diminutum
Ferrissia cf. hendersoni
Ficopomatus enigmaticus
Ficopomatus miamensis

Final Taxa

Ficopomatus sp.
Ficopomatus uschakovi
Gammarida sp.
Gammarus mucronatus
Gammarus sp.
Gastropoda
Gloiodbella elongata
Glossiphoniidae sp.
Glottidia pyramidata
Glycinde multidens
Glyptotendipes paripes
Glyptotendipes sp.
Goeldichironomus carus
Goeldichironomus sp.
Goniadides carolinae
Grandidierella bonnieroides
Grania monospermatheca
Halmyrapseudes cf. *bahamensis*
Hargeria rapax
Hargeria/Leptochelia sp. complex
Harnischia sp.
Hebetancylus excentricus
Helobdella elongata
Helobdella papillata
Helobdella sp.
Helobdella stagnalis
Heteroptera
Hirudinea
Hobsonia florida
Hyalella azteca
Hyalella sp.
Hyalella sp. A
Hyalella sp. C
Hydra sp.
Hydrachnidea

Final Taxa

Hydrobiidae
Hydroptila sp.
Hydroptilidae
Hydrozoa
Idoteidae
Ilyodrilus templetoni
Ischadium recurvum
Isopoda
Isotomurus sp.
Kirkegaardia sp.
Kirsteueriella cf. *biocellata*
Kurtiella planulata
Laeonereis cf. *longula*
Laeonereis culveri
Larsia sp.
Leitoscoloplos foliosus
Leitoscoloplos sp.
Leodamas rubrus
Lepidoptera
Leptoceridae
Leptochelia sp.
Libellula incesta
Libellula sp.
Libellulidae
Limnodriloides sp.
Limnodriloidinae
Limnodrilus hoffmeisteri
Limnodrilus sp.
Littoridinops palustris
Littoridinops sp.
Lumbriculus cf. *variegatus*
Macromia sp.
Mediomastus cf. *ambiseta*
Mediomastus sp.
Melanoides sp.

Final Taxa

Melanoides tuberculata
Melanoides turriculus
Melinna maculata
Melita nitida complex
Melita sp.
Membranipora cf. arborescens
Menetes
Minuspio perkinsi
Monopylephorus cf. parvus
Monopylephorus rubroniveus
Monticellina dorsobranchialis
Mulinia lateralis
Mysella planulata
Mysidae
Mytilidae
Mytilopsis leucophaeata
Naididae
Naidinae sp. A of EPC
Nais communis sp. complex
Nais pardalis
Nais variabilis
Nanocladius sp.
Neanthes succinea
Nemertea
Neoplea striola
Neotrichia sp.
Nereididae
Nereis sp. A
Neureclipsis sp.
Neurocordulia alabamensis
No Organisms Present
Odonata
Odostomia laevigata
Odostomiinae
Oecetis inconspicua

Final Taxa

Oecetis inconspicua complex

Oecetis nocturna

Oecetis sp.

Oecetis sp. A of Epler, 2001

Oligochaeta

Onobops sp.

Onuphidae sp.

Opistocystidae sp.

Orchestia sp.

Oribatida

Orthocladiinae sp.

Oxyurostylis smithi

Pagastiella sp.

Palaemonetes pugio

Palaeonemertea

Palpomyia sp.

Panopeidae

Parachironomus carinatus

Parachironomus directus

Parachironomus frequens

Parachironomus sp.

Parachironomus tenuicaudatus

Paralauterborniella nigrohalteralis

Paranais litoralis

Paranais sp.

Paraprionospio sp.

Paraprionospio yokoyamai

Peltodytes sp.

Perithemis tenera seminole

Pinnixa sp.

Pisidium punctiferum

Pisidium sp.

Placobdella ornata

Planorbella scalaris

Planorbidae

Final Taxa

Platyhelminthes
Podarkeopsis levifuscina
Polycladida sp.
Polydora cornuta
Polydora cornuta sp. complex
Polydora socialis
Polydora sp.
Polymesoda caroliniana
Polypedilum beckae
Polypedilum convictum
Polypedilum flavum
Polypedilum halterale grp.
Polypedilum scalaenum grp.
Polypedilum sp.
Polypedilum tritum
Pristina (Pristina) proboscidea
Pristina (Pristinella) cf. osborni
Pristina (Pristinella) sima
Pristina (Pristinella) sp.
Pristina leidyi
Pristina longidentata
Pristina proboscidea
Pristina sp.
Probezzia sp.
Procladius (Holotanypus) sp.
Procladius bellus var.1 Epler
Procladius sp.
Prosobranchia sp.
Prostoma sp.
Pseudochironomus sp.
Psychodidae
Pyrgophorus platyrachis
Pyrgophorus tuberculatus
Rhabditophora sp.
Rheumatobates sp.

Final Taxa

Rhithropanopeus harrisii
Rudilemboides naglei
Scoloplos rubra
Sessilia sp.
Sinelobus stanfordi
Sparganophilus sp.
Sphaeriidae
Sphaerium sp.
Sphaeroma terebrans
Sphaerosyllis sp.
Spionidae
Stenelmis sp.
Stenochironomus sp.
Stenocron interpunctatum
Stenoninereis martini
Stephensoniana trivandrana
Streblospio benedicti
Streblospio gynobranchiata
Streblospio sp.
Tagelus plebeius
Tanypodinae
Tanypus sp.
Tanytarsus sp.
Tanytarsus sp. A
Tanytarsus sp. G
Tanytarsus sp. G of Epler, 2001
Tanytarsus sp. K
Tarebia granifera
Thalassodrilides gurwitschi
Thalassodrilides sp.
Thiaridae sp.
Tribelos fuscicorne
Tribelos sp.
Trichoptera
Tricladida

Final Taxa

Tubificida sp.
Tubificidae w/ hair
Tubificidae w/o hair
Tubificoides/Tectidrilus with papillae
Tubulanus pellucidus
Turbellaria
Uromunna reynoldsi
Uromunna sp.
Vesciculariidae
Xanthoidea
Xenanthura brevitelson
Zygonemertes virescens
Zygoptera
NA

Master Benthic Data

The species synonymy data table was applied to the combined benthic data set.

Observations with only a year associated with them were assigned a date of 6/1/Year.

Salinity tolerances and water classifications from the literature were matched to final taxa where appropriate and available. The freshwater column was derived from the FDEP Statewide Biological Database designations. A supporting document with literature citations is available in SharePoint: /FrEco/Salinity Literature.docx.

The Final Master Benthic data set was output as a csv file and as an R data file.

source	n site-dates	n dates	n sites	n taxa
Master	373	94	292	363