

## **Appendix I5**

### **Benthics Raw Data Source Description**

## **Lower Hillsborough River Recovery Strategy - Master Benthic Macroinvertebrate Data README**

Southwest Florida Water Management District

Last Compiled on: 2024-07-18

### **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 m<sup>2</sup> effort) was used to convert to a count per m<sup>2</sup> 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

## DRAFT

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 m<sup>2</sup>). Observations were divided by this effort to calculate a number per m<sup>2</sup>.

| 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 m<sup>2</sup>). Observations were divided by this effort to calculate a number per m<sup>2</sup>.

| 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.

## DRAFT

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.  
Bocardiella 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 tribranchiata  
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 miamiensis

Final Taxa

---

Ficopomatus sp.  
Ficopomatus uschakovi  
Gammarida sp.  
Gammarus mucronatus  
Gammarus sp.  
Gastropoda  
Gloiobdella elongata  
Glossiphoniidae sp.  
Glottidia pyramidata  
Glycinde multident  
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  
Orthoclaadiinae 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 leidy  
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    |