



DEVELOPMENT OF A STATEWIDE COLLECTION AND DATABASE FOR AQUATIC MACROINVERTEBRATES IN SOUTH DAKOTA

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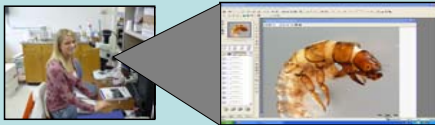


Introduction

Aquatic macroinvertebrates play critical roles in trophic dynamics, energy flow and biogeochemical cycling within aquatic ecosystems. These organisms also provide vital information as bioindicators of habitat and water quality and contribute significantly to biodiversity within lakes and rivers. Unfortunately, South Dakota has no central database from which macroinvertebrate occurrence and distribution can be drawn to support water resource studies and species monitoring programs. The objective of this project is to establish and maintain a statewide voucher collection and digital database complete with taxonomic organization, organic tolerance values, habitat and feeding guilds, state distribution, multiple images and specimen measurements, as well as detailed collection site location information.

Set-Up

Individuals in the best condition within each submitted vial are photographed using an Olympus DP71 digital camera, which is mounted to an Olympus SZX12 microscope. Dorsal, ventral, and special identification images of each specimen are photographed and archived within the database under the accession code assigned to those specimens. MicroSuite™ is used to view and edit images produced by the scope, take measurements, and assemble z-stack images.



Specimen Accession

Specimens may be deposited into the collection from any water resource assessment project conducted within South Dakota. However, we are not accepting unsorted samples or specimens with missing metadata. In addition, copies of project reports should be submitted alongside specimens as collection data required for the digital database exceeds that which would normally be placed on a vial label. Digital reports providing metadata in support of collected specimens are archived alongside digital images of specimens within the collection. Citations of these reports are included as metadata within the digital database.

Metadata Requirements

- Taxonomy
- Sampling Date
- Project Identification – Station Identification
- County
- Latitude, Longitude
- Township, Range, Section, Quarter Section
- Sampling Group
- Identification Group – Identification Individual
- Site Pictures

Contact Information

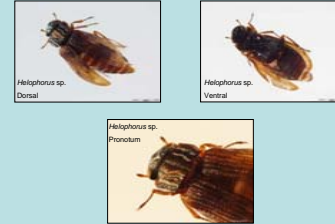
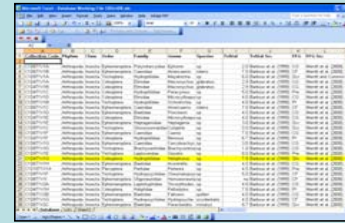
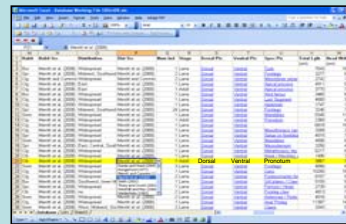
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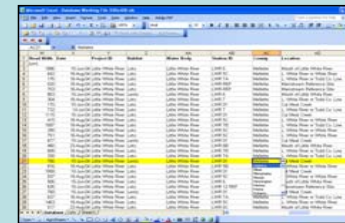
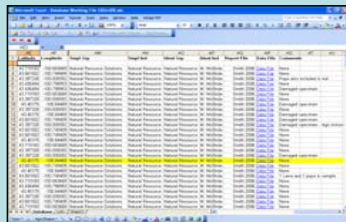
Working Database

Consists of:

- Taxonomic Data
- Organic Pollution Tolerance Values
- Feeding and Habitat Guilds
- Distribution
- Digital Images
- Collection Data
- Collection / Identification Groups
- Report / Publication Links



Length and head capsule measurements are also included within the database. These values are taken within the MicroSuite™ program. These measurements provide valuable information for comparison of specimens throughout life-stages in different sampling locations.



Complete collection metadata is provided including sampling date, county, site location identification, and latitude and longitude coordinates. Also, information on the sampling and identification groups is provided, including the individual responsible for identification.

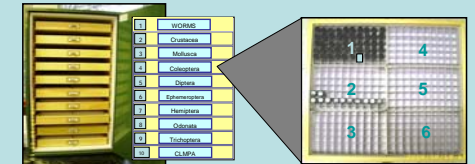
Acknowledgements

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Collection Organization

Vouchered macroinvertebrate specimens are maintained in vials with 70% ethanol and glycerin or are slide mounted. Unmounted specimens are curated in cabinets, drawers, and vial trays using a hierarchical cataloguing system. All specimens are transferred to vials with cone-sealed, screw-on lids. Mounted specimens are maintained in separate slide cabinets using a similar hierarchical scheme.

Slide mounted specimens are vouchered in separate slide cabinets using a hierarchical address similar to that demonstrated above. Most mounted specimens belong to the following three groups: Annelida, Chironimidae, and Nematoda.



WORMS – Nematoda, Platyhelminthes, Annelida
CLMPA – Collembola, Lepidoptera, Megaloptera, Plecoptera, Arachnida

SPECIFY Biodiversity Database

SPECIFY has been chosen as the official database package for the collection. This database package has been developed with the support of the National Science Foundation for use by natural history collections. It is designed to handle small to large collections and may be installed to operate as a stand alone system on a single computer or be hosted on a SQL server with open access over the Internet. We will develop the database on a stand alone system and work toward the objective of migrating the data to a network-based system at the end of this project.

SPECIFY allows for the tracking of specimen accessions and loans, viewing images of specimens, and the querying of specimens by taxonomy, water body, or project. This database also provides ecological attributes, life history stages, as well as specimen size and occurrence. Also, SPECIFY contributes to the examination of spatial distribution performed through a Google Earth Interface.

